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# REVIEW OF APPLIED MYCOLOGY

COMPILED FROM WORLD LITERATURE ON PLANT PATHOLOGY AND APPLIED MYCOLOGY




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HARRIS (ELIZABETH). **Ramulispora sorghicola sp. nov.**—*Trans. Brit. mycol. Soc.*, **43**, 1, pp. 80–84, 6 fig., 1960.

*R. sorghicola* Harris, the cause of a common leaf disease of sorghum in Nigeria, is described and illustrated and compared with *R. sorghi* [cf. **25**, 392] and *Gloeocercospora sorghi* [**39**, 657]. The mature lesions are irregular and pinkish grey to straw coloured with a dark red or tan border. Sclerotia are few and bear septate setae on the surface.

CARPENTER (J. B.), KLOTZ (L. J.), DEWOLFE (T. A.), & MILLER (M. P.). **Collapse of young Citrus trees in Coachella Valley.**—*Calif. Citrogr.*, **45**, 1, pp. 4, 19, 20, 21, 3 fig., 1959.

Between mid-July and mid-Sept. 1959 more than 1,200 young (7–30 months) trees died, including lime, grapefruit, orange, tangelo, and lemon, all on rough lemon rootstocks; those on sweet orange were not affected.

Apparently healthy plants die within 3–5 days from the onset of wilting; leaves remain attached and within 7–10 days become bleached. Recently collapsed trees and those starting to wilt have internal wood rot, almost always confined to the rootstock: all the wood in some transverse zone of the lower trunk is involved; overlying it the cambium and the inner bark are discoloured and apparently non-functional. The bark may be firm or decayed and damage to the root system may be extensive or confined to small areas of discoloured and rotted bark and wood on a few main and fibrous roots. The roots of the youngest collapsed trees are often in better condition than those of older ones, suggesting that infection in the roots of the latter may have been there for a relatively long time. Decayed fibrous roots were found most frequently on the stubbed lateral roots and also on the older portions of roots regenerated after planting: the damage at these points indicated an outward spread of infection from the main lateral roots.

Of the fungi isolated, the most frequent were spp. or strains of *Fusarium*, alone or together with other fungi. Next in number were isolates of *Rhizoctonia*; *Diplodia*, *Pleospora*, 'and fungi resembling *Spondylocladium*, *Helminthosporium*, and common molds' were also found. The wood-rotting fungi apparently enter through wounds in the main lateral roots or perhaps through small fibrous roots and not by direct penetration of the bark or wood of the tap root or trunk. A vascular type of infection was especially evident in some trees. In some of the older trees, with trunks about 3 in. diam., the trunk wood below the bud union was completely invaded and had a dark brown stain along the union: the infection had not spread up into the scion.

The condition seems closest to dry root rot [cf. **37**, 235], this outbreak being considered an unusual expression of a common, but usually minor, disease. There is no evidence that the collapse is due to a highly infectious fungus or that the soil at diseased sites is infested with a new or dangerous organism. No definite recommendation can yet be made as to the choice of a rootstock for replanting. Over-irrigation should be avoided.

MOREAU (C.). **'La moississure grise' des Oranges.** ['Grey mould' of Oranges.]—*Fruits d'outre-mer*, **15**, 2, pp. 69–71, 3 fig., 1960.

It is reported from the Lab. de Cryptogamie, Muséum Nat. d'hist. nat., Paris, that 31–82% of the deterioration of consignments of oranges from Algeria, harvested in spring 1959, was caused by *Botrytis cinerea* [cf. **36**, 584], which is present in the plantations and develops in transport and storage when great humidity follows

excessive cold [cf. **39**, 341]. Direct chemical control is difficult, but some success in prevention has been achieved [cf. **38**, 144].

Eckert (J. W.). **Lemon sour rot.**—*Calif. Citrogr.*, **45**, 1, pp. 30, 31, 35, 36, 2 fig., 1959.

From Univ. Calif. Citrus Exp. Sta. it is reported that lemon sour rot (*Geotrichum candidum*) [cf. **37**, 478; **38**, 144] occurs in storage rooms throughout the year, but the losses are not of major importance. Fruit from coastal districts is particularly prone to the disease and losses may be heavy after long wet winters.

Infection occurs when spores germinate on fresh wounds. Few of the spores are air-borne. Under favourable conditions (75–85° F. and high humidity) total breakdown of the fruit may occur in 5 days. Spore contamination of the fruit occurs by contact with soil, or from dust thrown or splashed up from the soil of uncultivated groves. Tight stacking of field boxes on the packing house floor for up to 3 days before processing provides high humidity, and if the fruit is warm when picked the heat may be retained, further encouraging infection. Most 48-hr. infections established under such conditions are barely visible, and the affected fruits are not rejected. Once in storage they decay completely in as little as 2 weeks. A spore-laden, syrupy fluid drips from the rotting fruit, and is transported by *Drosophila* flies, which accumulate and reproduce in this environment. They cannot, however, transmit the disease to healthy, uninjured fruit. Fruit lots with a high incidence of sour rot should never be dumped on the belts as they come from storage, as this leads to dangerous contamination of the equipment. As biphenyl does not afford protection against this infection, the solution to the problem is to be sought in handling methods rather than in chemical control. The suggestions made include careful picking, adequate ventilation of field boxes on the washer floor, and a min. interval between picking and washing. The wash water should be as hot as is practicable.

Miyakawa (T.). **Studies on the green and blue mold of Satsuma Orange. (3). Effects of rind contents on the growth of causal fungi.**—*Ann. phytopath. Soc. Japan*, **24**, 5, pp. 281–286, 5 graphs, 1959. [Jap. Abs. from Engl. summ.]

In further studies at the Hort. Exp. Sta., Ikuhina, Tokushima [cf. **39**, 311], mycelial growth of *Penicillium digitatum* and *P. italicum* was stimulated by methanol or acetone extracts from orange rind [cf. **39**, 171]. The stimulant adsorbed on active C and added at 0·5 g./80 ml. agar medium decreased growth of *P. digitatum*, though that of *P. italicum* was more vigorous. A larger addition (1–2 g.), however, in weakly acid medium, inhibited both fungi. It would appear that the extract contained both an inhibitory and a stimulative factor for *P. italicum*, but that the former did not affect *P. digitatum*.

Grierson (W.). **Indicator papers for detecting damage to Citrus fruit.**—*Circ. Fla. agric. Exp. Stas.* S-102, 4 pp., 1 col. fig., 1 diag., 1958.

From the Citrus Exp. Sta., Lake Alfred, Fla., a method is described for lining a bulk fruit truck with indicator papers to locate mechanical damage to the fruit. This is better than the method by which samples are tested with 'TTC' [cf. **35**, 603]. Filter or chromatography paper is best. Appropriate combinations of various dyes permit ready differentiation of peel oil and juice reactions.

Schneider (H.). **Sieve tube necrosis in nucellar Lemon trees.**—*Calif. Citrogr.*, **45**, 7, pp. 208, 219–222, 1 fig., 2 graphs, 1960.

Sieve tube necrosis in Eureka lemon [cf. **31**, 432] has now become so extensive in certain 10-yr.-old plantings of nucellar clones as to cause decline. The condition occurs in both inland and coastal areas, but it is in the latter that it is more likely to become a limiting factor in the transfer of food materials. The cause has not

yet been established, though it is known that the condition invariably occurs in some clones but never in others. The only known method of control is by elimination of the former. Three groups have been distinguished, viz. Price, Monroe, Keene, Ledig, and Prior Lisbons, almost completely free from the disease; Rosenberger, Cavers, Dr. Strong, Galligan, and Thille Lisbons, occasionally slightly affected; and Laidlaw and CES Villafrancas, the Deaver, Jameson open, Jameson semi-dense, and Frost nucellar Lisbons, and all old and nucellar lines of Eureka, which were severely affected.

BIANCHINI P. (C. L.). **Sintomas, prevención y combate de las principales enfermedades del Cafe en Costa Rica.** [Symptoms, prevention, and control of the main diseases of Coffee in Costa Rica.]—*Suelo tico*, **11**, 44, pp. 37–48, 1959.

Much of the work on these diseases has already been noticed [**37**, 660; **38**, 144].

D'OLIVEIRA (B.). **As ferrugens do Cafeeiro.** [Coffee rusts.]—61 pp., 2 col. pl., 3 fig., Estação Agronómica Nacional, Oeiras, [? 1959. Engl. summ.]. (Reprinted from *Rev. Café Portug.*, **1**, 4, pp. 5–13, 1954; **2**, 5, pp. 5–12; 6, pp. 5–13; 7, pp. 9–17; 8, pp. 5–22, 1955; **4**, 16, pp. 5–15, 1957.)

The occurrence of *Hemileia vastatrix* [map 5] and *H. coffeicola* in overseas Portuguese territories is surveyed. Both spp. are present in S. Tomé and Principe [**38**, 745], only the former in Mozambique and Timor, and neither in Angola, Cape Verde Islands, or Portuguese Guinea.

Work at Sacavém, Portugal, on these rusts was begun in 1951 and has been continued at the Centro Invest. Ferrug. Caf., Oeiras, since 1955. Tabulated are over 1,000 accessions of *Coffea* spp. and vars. and 200 strs. of *H. vastatrix* from coffee growing countries. So far rust from *C. arabica*, *C. canephora*, *C. stenophylla*, *C. abeokutae*, and *C. racemosa* has been received.

Details are given of the technique of inoculation and the method of assessing reaction. Five physiologic races (I–V) of *H. vastatrix* [**35**, 164] have been differentiated. The *Coffea* accessions have been classified into 6 groups (A–F) according to their reactions to these races. Within *C. arabica* A, C, D, and E occur. Group A contains plants immune from all races tested and includes a few plants from the Mysore Coffee Exp. Sta., Bangalore, India, and a few from Ethiopia. Group C plants are immune from all but race III and are represented by a few plants of Ethiopian origin. Group D plants, immune from all but race I, are of a widespread type and include, e.g. selections from Kent's, K7 from Kenya [**38**, 293], etc. Group E plants are susceptible to all races found on *C. arabica*, and comprise the majority of *arabica* vars. Within *C. canephora* (*sensu lato* including *C. robusta*) groups A and F occur; F includes spp. and vars. susceptible to all races, including IV innocuous on *C. arabica*. The types of reaction in other *C.* spp. are also given in detail.

The necessity for more intensive rust sampling in the field is emphasized. Maynes' findings ([**27**, 419] and *Bull. Mysore Coffee Exp. Sta.* 24, pp. 1–21, 1942) on physiologic specialization in *H. vastatrix* and the investigation of the sexual stage [see below] are discussed.

VISHVESHWARA (S.) & NAG RAJ (T. R.). **Nuclear status in basidiospores of Hemileia vastatrix B. & Br.**—*Indian Coffee* (*Mon. Bull. Indian Coffee Bd*), **24**, 3, pp. 118–119, 3 fig., 1960.

Cytological studies at the Coffee Res. Sta., Balehonnur, were carried out on basidiospore formation in *H. vastatrix*. Binucleate teliospores [**3**, 647], in which karyogamy occurred before germination, were produced among the uredospores. The promycelium consists of 4 uninucleate cells, and mature basidiospores either uninucleate or, more generally, binucleate were produced.

Nag Raj (T. R.) & George (K. V.). **A disease of Coffee hitherto undescribed from India.**—*Indian Coffee* (*Mon. Bull. Indian Coffee Bd*), **24**, 3, pp. 120–122, 2 fig., 1960.

A note from the Coffee Res. Sta., Balehonnur, Mysore, on the occurrence, symptoms, and control of *Sclerotium coffeicola* [cf. **37**, 354], observed on coffee for the first time in India in Sept. 1959.

Nag Raj (T. R.) & George (K. V.). **A new species of Sarcopodium on Coffee from India.**—*Curr. Sci.*, **29**, 5, pp. 192–193, 6 fig., 1960.

A fungus, for which the name *S. coffeanum* Nag Raj & George is proposed, was found on a single bush of Arabian coffee at the Coffee Res. Sta., Balehonnur, India. It occurred on oval or round, occasionally zonate, brown leaf spots, up to 3 cm. in diam., on the margins of which the mycelium formed a white, slightly effuse fringe, showing characteristic dendroid markings. Conidiophores $11{\cdot}8\times1{\cdot}8$ ($8{\cdot}4$–$16{\cdot}8\times1{\cdot}4$–$2{\cdot}1$) $\mu$ bearing conidia $5{\cdot}7\times1{\cdot}7$ ($5{\cdot}2$–$6{\cdot}5\times1{\cdot}4$–$2{\cdot}1$) $\mu$ were present on both surfaces of the spots.

Dadant (R.). **Le dépérissement parasitaire du Coffea arabica sur les hauts plateaux de Madagascar.** [The parasitic decline of Arabica Coffee on the high plateaux of Madagascar.]—*Agron. trop., Paris*, **15**, 2, pp. 213–230, 6 fig., 6 graphs, 1960. [Engl., Span. summ.]

Coffee growing in very poor cultural conditions (close to native villages, especially near Faratsiho) at altitudes of over 1,200 m. is affected by wilting, starting at the apex, a grey, later red, discoloration of the leaves, rapid leaf fall, and branch necrosis. The cause is *Fusarium* sp. near *lateritium* [cf. **35**, 449; **38**, 745], but the spore size ratio is larger. It produced similar symptoms in wounded and unwounded coffee plants and was re-isolated. The cultural characters of the fungus are described in detail. Control is recommended by the development and use of resistant vars.

Firman (I. D.). **A Coffee seedling disease.**—*Kenya Coffee*, **25**, 292, pp. 130, 135, 1960.

During recent months what appears to be a fungal disease of coffee seedlings has been seen in many parts of Kenya; it first becomes apparent by the wilting of young leaves. The stem externally is normal but if the bark is scraped away a dead region is found 1–3 in. above the ground; above and below, the tissue immediately under the bark is a normal green, but at an early stage a typical circular or oval fungal lesion is present under the outer layer of bark and the affected part becomes brown. The lesions often appear to start near a leaf scar; *Fusarium* spp. [cf. above] have consistently been isolated. The fungus is thought to be a weak parasite of plants growing in unfavourable conditions; the planting of strong seedlings only should considerably reduce incidence.

Dickson (R. C.) & Laird (E. F.). **Disease of Cotton.**—*Calif. Agric.*, **14**, 1, p. 14, 3 fig., 1960.

This popular note from the Univ. California, Riverside, records that cotton leaf crumple virus [cf. **38**, 746] has proved infectious on all cotton lines tested. Symptoms are generally much less severe in Pima than in Acala 4–42 or Deltapine. There is as yet no proof that the virus infects plants other than cotton, though suspicious symptoms have appeared in test plants of okra [*Hibiscus esculentus*] and hollyhock. In the field the virus overwinters in stub or abandoned cotton. There is definitely no seed transmission.

Allen (R. M.), Tucker (H.), & Nelson (R. A.). **Leaf crumple disease of Cotton in Arizona.**—*Plant Dis. Reptr*, **44**, 4, pp. 246–250, 1960.

Substantial reductions in yield ($20{\cdot}6\%$ in the seeded and $16{\cdot}8$ in the stubbed crop) caused by cotton leaf crumple virus [cf. above] were recorded by Ariz. agric. Exp.

Sta., Tuscon, for 8 Acala vars. The number of bolls particularly decreased and also the size of the bolls; seeds were smaller and lighter, and the fibre length was slightly reduced.

BEKUZIN (A. A.). **Aphids.—Vectors of virus diseases in fine-fibred Cotton plant.**—Труд. Инст. Зоол. Паразитол. Акад. Наук Уз ССР [*Trud. Inst. Zool. Parazitol. Akad. Nauk Uz. S.S.R.*], *1956*, 7, pp. 89–100, 1956. [Russ. *Biol. Abstr.*, **35**, 8, p. 1954, 1960.]

Symptoms of viral leaf twisting are described. Inoculation tests on 56 vars. showed that only fine-fibred vars. could be infected, while the hybrids *Gossypium hirsutum* × *G. barbadense* were immune. In 90% of infected plants the virus was transferred by the cotton aphid (*Aphis gossypium*), which is also the chief vector of the disease in Turkmen S.S.R., and in up to 4% by *A. laburni*; *Thrips tabaci* and leafhoppers of Jassidae could not effect transmission. The ability of the cotton aphid to transfer infection lasted for at least 10 days after feeding, but decreased gradually.

BAZÁN DE SEGURA (C.). **New type of symptoms on Verticillium wilt of Cotton.**—*Plant Dis. Reptr*, **44**, 4, p. 256, 3 fig., 1960.

Cotton leaves from Rimac Valley, Lima, Peru, affected by *V. alboatrum* [**36**, 697] had purple veins, adjacent tissues later turning brown and necrotic, and sometimes also circular purple, later brown, necrotic spots 4–5 mm. diam.

LAGIÈRE (R.). **La bactériose du Cotonnier, Xanthomonas malvacearum (E. F. Smith) Dowson, dans le monde et en République Centrafricaine (Oubangui-Chari). Observations et recherches.** [Bacteriosis of Cotton, *X. malvacearum*, in the world and in the Central African Republic (Ubangui-Chari). Observations and researches.]—252 pp., 13 col. pl., 9 fig. (2 col.), 4 graphs, 1 map, Paris, Institut de Recherches du Coton et des Textiles Exotiques, [? 1960. 280 ref.]

After an introductory section (pp. 15–18) on symptoms, the text is divided into 4 main sections dealing, respectively, with the causal organism (pp. 25–44), its morphology, structure, biochemical and biological properties, associated bacteria, and hosts; the disease, its persistence and dispersion (pp. 47–95); the reaction of cotton vars. (pp. 97–118); and control (pp. 125–201). The conclusions (pp. 207–210) cover symptoms, physiologic races, the development of the disease, seed treatment, and the production of resistant hybrids. There are 5 appendixes, dealing with methods of isolation, culture media, seed treatment, methods of inoculation, and the selection of resistant hybrids.

Researches in C. Africa began in 1948 and were directed mainly at control methods; the results have been published [**33**, 673–4]. Other measures for reducing the disease are choice of sowing date (ca. 20 June) to avoid epochs of intense, primary and secondary infection, and breeding for resistance [**37**, 409]. Over 800 lines homozygous for resistance have been selected and the characters of 120 of these have been reported; 13 genes or associations of genes have been recognized and transmitted [cf. **39**, 414].

LAST (F. T.). **Effect of Xanthomonas malvacearum (E. F. Sm.) Dowson on Cotton yields.**—*Emp. Cott. Gr. Rev.*, **37**, 2, pp. 115–117, 1960.

At the Gezira Research Sta., Republic of the Sudan, separating belts of recently developed cotton vars. carrying combinations of Knight's resistance factors, including B [**39**, 413] were used to restrict the spread of *X. malvacearum* and enable a comparison of healthy and diseased plants of a susceptible var. to be made in the same experiment. Seedlings from naturally infected seed of X 1730 A sown on 9 and 30 Aug. 1958 in the centre of the test plots first displayed lesions about 2 and

26 Sept., respectively. Later, *X. malvacearum* spread rapidly to the susceptible Domains Sakel (seed treated with abavit, all sown on 9 Aug.) in the two above test plots and it became 90% diseased by 16 Sept. and 5 Oct., respectively. Only 2 of 16 groups of infector seedlings sown on 20 Sept. became affected.

Yields were reduced (by about 20% [cf. **38**, 746]) only by spread from the earliest-sown infectors; early infection also delayed harvesting; thus, 51% of the plants in a healthy control plot were harvested by 8 Jan. 1959, but only 40% of the earliest infected. This confirms the view that *X. malvacearum* reduces the early crop.

As the yields of plants which first became diseased in Oct. were not affected, it appears that counts of infected plants made in Sept. may be better indicators of damage in the Gezira than those made in Oct.

BALACHANDRAN *et al.* **Preliminary note on the effect of antibiotics as a control for blackarm disease for Cotton.**—Abs. in *Madras agric. J.*, **47**, 1, pp. 29–30, 1960.

Field-scale spray trials (3 sprays of phytomycin or of streptomycin) at the Agric. Res. Sta., Bhavanisagar, in summer 1957 and 1958 gave considerable check of blackarm (*Xanthomonas malvacearum*) [**36**, 310], which is becoming serious in Madras. In the 1st yr. the degree of control was 87 and 93%, for the 2 treatments, respectively, compared with untreated plots, and in the 2nd yr. 56 and 51%. Bordeaux mixture gave good control the 1st yr. but was less effective in the 2nd.

ZAHARIADI (C.). **Flambarea semințelor de Bumbac cu aparatul I.C.A.R.** [Cotton seed flaming with the apparatus I.C.A.R.]—*Anal. Inst. Cerc. agron. Român.*, Ser. C., **26** (*1958*), pp. 287–303, 2 pl., 4 fig., 1959. [Russ., Fr. summ.]

The construction and functioning of this apparatus are described. Delinting by flame is claimed to reduce gummosis [*Xanthomonas malvacearum*] to about the same degree as delinting with $H_2SO_4$ and not to affect germination. Fungicidal treatment follows flaming. To overcome the roughness of the flamed seed impeding the use of standard sowing drills a special coating is applied, which renders the surface perfectly smooth.

PIETKIEWICZ (T. A.). **Mikroflora nasion Konopi. Przegląd literatury.** [The microflora of Hemp seed. Survey of the literature.]—*Roczn. Nauk rol.*, **77** (Ser. A), 4, pp. 577–590, 1958. [Russ., Engl. summ. Abs. in *Referat. Zh. Biol.*, *1960*, 4, p. 187, 1960.]

Hemp seeds in 481 samples from different parts of Poland examined at the Instytut Ochrony Roślin, Reguly, in 1952–55 were heavily infected by *Botrytis cinerea*, *Fusarium lateritium*, *F. oxysporum*, *Alternaria tenuis*, *Rhizopus nigricans* [*R. stolonifer*], *Trichothecium roseum*, *Cladosporium herbarum*, and other fungi [cf. **39**, 333].

STONE (W. J.) & JONES (J. P.). **Corynespora blight of Sesame.**—*Phytopathology*, **50**, 4, pp. 263–266, 5 fig., 1960.

Defoliation and death of sesame at the Miss. agric. Exp. Sta., Stoneville, in autumn 1958 was shown to be caused by *C. cassiicola* [**32**, 342]. Cross inoculation to and from soybean [**38**, 724] was successful, but the conidia of both isolates were somewhat broader on sesame (10·02–10·06 $\mu$ against 8·26–8·93). The fungus was carried both on and within the seed of both hosts.

ELIADE (EUGENIA). **Contribuţiuni la cunoaşterea bolilor plantelor din Grădina Botanică din Bucureşti.** [Contributions to the knowledge of plant diseases in the Botanical Garden, Bucharest.]—*Lucr. Grăd. bot.*, *1959*, pp. 115–129, 5 fig., 1960. [Russ., Germ. summ. 20 ref.]

A list of 126 fungi on 161 hosts in 1957–9, including, *inter alia*, *Peronospora arbor-*

*escens* on opium poppy, *P. manshurica* on soybean, *Sphaerotheca fuliginea* on *Calendula officinalis*, *S. pannosa*, *Diplocarpon rosae*, and *Coryneum microstictum* on rose, *Oidium lini* on flax, *O. dianthi*, *Septoria sinarum*, and *Alternaria dianthi* on carnation, *Ascochyta cinerariae* on cineraria, *A. hydrangeae* on *Hydrangea opuloides*, *Septoria chrysanthemella* on chrysanthemum, *S. lavandulae* on lavender, *Heterosporium pruneti* and *Puccinia iridis* on iris, and *Mystrosporium polytrichum* on gladiolus.

Žuklys (L. P.). **Naujai aptiktos Lietuvoje sumedėjusių dekoratyvinių augalų ligos.** [Diseases of ornamental trees newly found in Lithuania.]—*Darb. Liet. TSR moks. Akad.*, Ser. C, *1960*, 1 (21), pp. 19–28, 9 fig., 1960. [Russ. summ.]

These records come from the Bot. Gdns, Inst. Biol.: *Cryptospora betulae* on drying and dry birch branches (*Betula* sp.); *Cryptomyces maximus* infecting branches and sprigs of different willow vars.; and *Sphaeropsis juglandis* causing some slight damage to walnut (*Juglans regia*). Young plants of *Juniperus virginiana* were heavily infected by *S.* sp.; *S.* sp. was found on dry branches of *Fraxinus excelsior* var. *pendula*. *Septomyxa* spp. caused serious damage to trees in the Gardens and in plantations in Kaunas, *Acer negundo* being very severely infected by *S. negundinis*, willow vars. by *S. picea*, and, to a lesser extent, *Rhus typhina* by *S. rhois*. *Coryneum disciforme* parasitizes various lime (*Tilia*) spp.

Allison (Patricia). **Azalea petal blight is in the Philadelphia area.**—*Morris Arbor. Bull.*, **11**, 2, pp. 27–30, 11 fig., 1960.

*Ovulinia azaleae* [cf. **36**, 470; **39**, 314] made its appearance on azaleas (*Rhododendron*) in Philadelphia in 1958. Zineb and actidione-RZ [schedules unspecified] gave spectacular control on the flowers throughout the blooming period, and the latter is also recommended as a ground spray.

Rubio (M.). **Inclusiones intracellulares producidas por diferentes virus del Clavel (Dianthus caryophyllus).** [Intracellular inclusions produced by different Carnation viruses.]—*Microbiol. esp.*, **12**, 4, pp. 331–338, 6 fig., 1959. [Engl. summ.]

A study of the histopathology of carnation mosaic [cf. **39**, 315], vein-mottle, and mottle viruses, as well as a virus isolated from carnation plants in Spain but not yet classified. Two types of inclusion bodies were found in association with carnation mosaic virus, one granular and the other amoeboid. Carnation vein-mottle virus also induces the formation of amorphous inclusion bodies in the host cells. No inclusion bodies were found in plants infected by carnation mottle virus. Crystalline type inclusions were found in plants infected by the unidentified virus. The possibility of carnation mosaic virus disease resulting from a mixed infection is discussed in relation to the 2 different types of inclusion bodies found in the same cell in infected plants.

Nelson (P. E.), Tammen (J.), & Baker (R.). **Control of vascular wilt diseases of Carnation by culture-indexing.**—*Phytopathology*, **50**, 5, pp. 356–360, 1 diag., 1960. [41 ref.]

In further work [**39**, 584] by Cornell Univ., Ornamentals Res. Lab., Farmingdale, Long Island, N.Y., Pa State Univ., Univ. Park, and Colo. State Univ., Fort Collins, many proposed methods of culture indexing were reviewed. The effectiveness of Hellmer's broth method [**34**, 524] for detecting infection by *Fusarium oxysporum* f. *dianthi*, *Pseudomonas caryophylli*, and other contaminants was determined. Of 3,546 cuttings indexed, 0·4% yielded pathogens, and of 2,121 plants established as single units in a nucleus block, 10 developed wilt symptoms within 14 months. Hellmer's method therefore does not give 100% detection, and the nucleus blocks should be renewed annually as recommended by Tammen *et al.* [**36**, 647], the yearly culturing involved being a further safeguard.

Brierley (P.) & Lorentz (P.). **Healthy tip cuttings from some mosaic-diseased Asiatic Chrysanthemums ; some benefits and other effects of heat treatment.**—*Phytopathology*, **50**, 6, pp. 404–408, 4 fig., 1960.

Cultivation of chrysanthemums from Japan and Taiwan, infected by tomato aspermy virus and unspecified mosaic viruses [**37**, 481; cf. **38**, 7], in a glasshouse at 35° C. gave healthy tip cuttings (19 out of 22 and 5 out of 10 from the respective sources) after 2–8 months. Improvement in growth vigour varied according to the virus tolerance of the var. The high temp. induced fasciation and devernalization in some of the Jap. vars., but not in Amer. or Engl. vars. treated similarly.

Waddell (H. T.). **Parasitism of Septoria obesa Syd. and S. chrysanthemella Sacc. on the cultivated Chrysanthemum.**—*Diss. Abstr.*, **20**, 7, p. 2482, 1960.

These 2 spp. were found in diseased chrysanthemum leaves collected in U.S.A. [cf. **36**, 646], the former being the more prevalent. In studies at Univ. Fla it was found that the opt. pH for the growth of each in a liquid medium at 20° C. was 5–7; none occurred at pH 2 or 10. The opt. temp. for growth on a solid medium was 20°–28° C. Pycnidiospores of each fungus germinated at 8°–28° but not at 4° or 32°. *S. chrysanthemella* did not sporulate in the absence of N or when $(NH_4)_2SO_4$ was the N source.

*S. obesa* severely attacked all of 22 chrysanthemum vars. inoculated, inducing brown to black lesions of indefinite shape and size and frequently killing entire leaves. *S. chrysanthemella* also infected all 22 vars., causing black, circular lesions, mostly under 1 cm. diam., but only the vars. Mary L. Hall and Bonnie consistently developed severe infection.

Infection and disease development were favoured by moisture and by mild or cool temps. Pycnidiospores in diseased leaves left on the ground in Dec. remained viable until Mar. only.

Host penetration took place by hyphae of germinating pycnidiospores entering stomata in the abaxial leaf surface. No haustoria were found.

Tandon (R. N.) & Bilgrami (K. S.). **A note on the perfect stage of Phyllosticta cycadina (Pass.).**—*Curr. Sci.*, **29**, 6, pp. 227–228, 2 fig., 1960.

At Dept Bot., Univ. Allahabad, ascospores of *Teichospora indica* Tandon & Bilgrami from *Cycas revoluta* leaves, on which they proved non-pathogenic, yielded a culture of *P. cycadina* [**34**, 724] when inoculated on a medium prepared with the dead leaves of the host. When leaflets of *C. revoluta* were sprayed with a *P. cycadina* spore suspension perithecia of *T. indica* often developed subsequently and ascospores from these perithecia gave rise to *P. cycadina*. It is thus concluded that *T. indica* is the perfect state of *P. cycadina*.

Patil (S. S.) & Young (R. A.). **The influence of temperature on development of Phytophthora parasitica root rot of Fuchsia.**—*Phytopathology*, **50**, 5, pp. 386–388, 1960.

Further details from Ore. State Coll., Corvallis, of information already noticed [**39**, 415].

Nichols (L. P.). **Corm and soil treatment for the control of bacterial scab of Gladiolus.**—*Plant Dis. Reptr*, **44**, 6, pp. 417–418, 1960.

At Pa State Univ., Univ. Park, delsan A-D (60% thiram, 15% dieldrin; 2 level tablespoons/100 corms) and the liquid Hg fungicide emmi (1 cup/25 gal. water)+ 5% heptachlor (63·6 g./100 ft. row) reduced scab (*Pseudomonas marginata*) [**39**, 175] from 68·5% (no treatment) to 36 and 46%, respectively.

Tilak (S. T.). **A new species of Colletotrichum from an economic host.** —*Curr. Sci.*, **29**, 4, p. 147, 3 fig., 1960.

At M.A.C.S. Lab., Poona, India, blighting of jasmine leaves and shoots was found to be caused by an as yet unrecorded sp., *C. jasminicola* [cf. **37**, 204], which is described; the spores were 8–11 × 3–5 $\mu$.

Corbett (M. K.). **Purification by density-gradient centrifugation, electron microscopy, and properties of Cymbidium mosaic virus.**—*Phytopathology*, **50**, 5, pp. 346–351, 3 fig., 1 graph, 1960. [22 ref.]

At agric. Exp. Sta., Gainesville, Fla, [orchid] (Cymbidium) mosaic virus [cf. **37**, 484], isolated from Cattleya orchids with sunken, reddish-brown, necrotic streaks on the leaves, was tested on 30 spp. of 7 families of non-orchidaceous hosts; only *Datura stramonium* and 3 spp. of *Cassia* could be mechanically infected. *C. occidentalis* proved the most useful local lesion host, small brown spots appearing after 4–6 days on inoculated leaflets, but no systemic infection. The physical properties and electron microscopic purification of the virus are described. The virus particles were sinuous rods, 18 m$\mu$ wide, and > 60% were 480 m$\mu$ long [cf. **35**, 17].

Chinnov (E. A.). Меры борьбы с серой гнилью Пеонов. [Control measures for grey rot of Peonies.] Защ. Раст., Москва [*Zashch. Rast., Moskva*], **5**, 6, p. 36, 1960.

A light, well-drained soil, disinfection of roots in 1% $CuSO_4$ solution, good ventilation of hot-beds and conservatories, thin planting, use of K and P fertilizers, spraying at 7–10 day intervals until the end of flowering with 1% Bordeaux mixture or Ca bisulphite, and soil application of DDT to keep away ants, the vectors of the infection, are recommended, *inter alia*, for control of grey rot [?*Botrytis paeoniae*: cf. **39**, 26] by the Moscow State Univ.

Rubio (M.) & Rosell (M.). **Estudio de un nuevo virus encontrado en Petunia hybrida.** [Study of a new virus found in *P. hybrida*.]—*Microbiol. esp.*, **12**, 2, pp. 105–138, 16 fig., 1959. [Engl. summ.]

This virus, found in petunia plants in a Madrid garden, produces a bright yellow mottle in the leaves and dark rings in the discoloured corolla. In tobacco it gives small, dark brown, necrotic lesions in the inoculated leaves; the infection does not become systemic. In petunia granular inclusion bodies, seen by the electron microscope to be composed of virus particles and amorphous material, are produced. The virus is easily transmitted mechanically and is not seed-borne; the thermal inactivation point is 50–55° C. and the dilution end point $1 \times 10^{-2}$. Its properties are compared with those of others infecting petunias and the name petunia yellow mottle is proposed.

Rubio (M.). **Nota previa sobre un virus de tipo 'ringspot' encontrado en Petunia hybrida Vilm.** [A preliminary note on a 'ringspot' type virus found in *P. hybrida*.]—*Microbiol. esp.*, **12**, 4, pp. 325–330, 3 fig., 1959. [Engl. summ.]

Another new virus in petunia [see above] is reported from Madrid; it produces systemic infection with ringspot symptoms in tobacco, *Nicotiana glutinosa*, and petunia spp., but does not infect *Datura stramonium*, tomato, *Capsicum frutescens*, cowpea, *Vigna sesquipedalis*, or bean (*Phaseolus vulgaris*). Amorphous and crystalline inclusion bodies are produced. The virus is sap-transmissible and the particles are flexuous rod-shaped.

Pearman (J. A.). **Diseases of Roses.**—*Agric. Gaz. N.S.W.*, **71**, 2, pp. 62–70, 13 fig., 1960.

Much of this information on the symptoms and control of the most common

diseases affecting roses has been noticed [**32**, 189; **38**, 523]. Also included are rust (*Phragmidium mucronatum*) and rose mosaic virus, neither of which is of economic importance.

MOKRITSKAYA (Mme M. S.). Ржавчина Роз и меры борьбы с ней в условиях Ленинградской области. [Rose rust and control measures in the conditions of the Leningrad region.]—Сборн. Раб. Инст. прикл. Зоол. Фитопатол. [*Sborn. Rab. Inst. prikl. Zool. Fitopatol.*] 5, pp. 222–236, 1958.

Much of this information on *Phragmidium* spp. has been noticed elsewhere [**39**, 110], but recommendations are given here for agrotechnical and chemical control suitable for use in nurseries, glasshouses, and plantations.

JAUCH (CLOTILDE). **El mildiou de los Rosales (Peronospora sparsa Berk.).** [Rose downy mildew (*P. sparsa*).]—*An. Soc. cient. argent.*, **168**, 3–6, pp. 52–59, 1 col. pl., 3 fig., 1959.

This paper from the Fac. Agron., Univ. Buenos Aires, draws attention to considerable variation in the symptoms caused by *P. sparsa* [cf. **19**, 98] on different rose vars., Killarney being the least susceptible. Where plants are raised indoors adequate ventilation and a high temp. are recommended, to avoid humidity.

KLINKOWSKI (M.). **Untersuchungen über Blattfleckenkrankheiten des Usambaraveilchens.** [Investigations on leaf spot diseases of Usambara Violet.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 355–366, 10 fig., 1959. [Roman. summ.]

A description from the Deutsche Akademie der Landwirtschaftswissenschaften, Berlin, of a leaf spot affecting *Saintpaulia ionantha* and related genera in early Aug. No evidence of a virosis could be found [cf. **35**, 770].

PUTT (E. D.) & SACKSTON (W. E.). **Resistance of inbred lines and hybrids of Sunflowers (Helianthus annuus L.) in a natural epidemic of Aster yellows.**—*Canad. J. Pl. Sci.*, **40**, 2, pp. 375–382, 1960.

At the exp. Farm, Canada Dept Agric. Morden, Man., resistance of sunflowers to aster yellows virus [**37**, 710] was found to be dominant and occurred in association with resistance to leaf mottle [*Verticillium alboatrum*: **37**, 549].

NOZZOLILLO (CONSTANCE) & CRAIGIE (J. H.). **Growth of the rust fungus Puccinia helianthi on tissue cultures of its host.**—*Canad. J. Bot.*, **38**, 2, pp. 227–233, 2 pl. (11 fig.), 1960.

At the Plant Res. Inst., Canad. Dept Agric., Ont. [cf. **38**, 398], callus growth from rust-infected sunflower cotyledons was negligible on agar media, but was more prolific from infected stem and hypocotyl sections. Basidiospore infections gave rise to abundant tuft-like, haploid surface mycelium, almost entirely absent from uredospore infections, which produced abundant uredospores and finally teliospores. Where 2 basidiospore infections of different mating types coalesced, copious aecidiospores were followed by uredospores and teliospores. Tufts of mycelium grew on the new callus growth of some cultures, and in 1 callus a number of more or less subnormal developing pycnia and aecia were found. Only a few sections produced callus tissue capable of surviving repeated subculturing, though on one section rust mycelium appeared as tufts on 6 of the calluses in the 4th set of subcultures [cf. **39**, 394].

MÜHLE (E.). **Untersuchungen über den Wirtspflanzenkreis der auf einigen Futtergräsern besonders stark auftretenden Formen des Kronenrostes Puccinia coronata Cda.** [Investigations on the host range of forms of crown rust *P.*

*coronata* of a particularly frequent occurrence on some fodder grasses.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 499–513, 2 fig., 1959. [Roman. summ.]

At Univ. Leipzig the host range of *P. coronata* was determined by inoculations of 112 grass spp. with populations and single spore lines from *Arrhenatherum elatius*, *Festuca pratensis*, and *Lolium multiflorum*. Though inoculation was largely successful, the isolates from the 3 sources tended to be specific for the original host and a limited number of others.

HIRSCHHORN (ELISA). **Systematic and cytologic characteristics of the Ustilago spp. that attack the Paspalum in Argentina and Uruguay.**—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 297–316, 64 fig., 1959. [Roman. summ.]

Descriptions are presented from Inst. Plant Path., Castelar, Buenos Aires, Argentina, of *U. microspora* var. *paspalicola* Hirschhorn, which lacks the membrane of fungal tissue covering the sorus typical of *U. microspora*, and of *U. linderi* Hirschhorn with sori covered by a membrane of the host tissue, ellipsoid chlamydospores with bilateral prolongations, and sterigmata at the apex of the promycelial and mycelial branches. Both were found on several *P.* spp. The latter is regarded as a new sp., possibly representing a new genus intermediate between Ustilaginaceae and Tilletiaceae.

WEBSTER (J.) & DIX (N. J.). **Succession of fungi on decaying Cocksfoot culms. III. A comparison of the sporulation and growth of some primary saprophytes on stem, leaf blade and leaf sheath.**—*Trans. Brit. mycol. Soc.*, **43**, 1, pp. 85–99, 4 diag., 1 graph, 1960.

In further studies [cf. **36**, 592] at Univ. Sheffield frequency of fruiting colonies on standing stems of *Dactylis glomerata* is compared with uprooted culms.

DEVERGNE (J. C.). **Identification à partir de Trifolium repens L. d'un virus proche du virus de la mosaïque jaune du Haricot Phaseolus virus 2, Smith.** [The identification from *T. repens* of a virus resembling Bean yellow mosaic virus.] —*Ann. Épiphyt.*, **10** (*1959*), 4, pp. 475–489, 5 fig., 1 graph, 1960. [22 ref.]

In a study at the Station centrale de Pathologie végétale, Versailles, of a yellow, interveinal mosaic of white clover growing in the vicinity, the disease was transmitted by mechanical inoculation to a number of legumes. On beans (*Phaseolus vulgaris*) of several vars. the virus induced a necrotic reaction, on peas it caused a wilt (inoculated plants remaining dwarfed) accompanied by mosaic, and on cowpea it caused local, reddish-brown lesions and a systemic chlorosis. *Medicago hispida* developed symptoms, but cultivated lucerne and tobacco did not react to inoculation.

Some of the symptoms produced resembled those caused by strs. of bean yellow mosaic virus [cf. **39**, 177], and the virus was very close to the necrotic str. from white clover described by Houston & Oswald [**33**, 87]. The virus belonged to the serological group of bean mosaic viruses. It consisted of flexuose rods about $11 \times 530$ m$\mu$ av. length and therefore differed appreciably from the type of bean yellow mosaic. White clover may, perhaps, play an important part in the conservation of viruses injurious to legumes.

RAZVYAZKINA (Mme G. M.). Цикада **Aphrodes bicinctus Schrank**—переносчик нового вирусного заболевания Клевера — позеленения цветков. [The leafhopper *A. bicinctus*—the vector of a new virus disease of Clover—viridescence of the flowers.]—*Zool. Zh.*, **38**, 3, pp. 494–495, 1959. [Engl. summ. Abs. in *Referat. Zh. Biol., 1960*, 7, p. 256, 1960.]

This disease was found in the Moscow region. *A. bicinctus* was demonstrated to be

a vector, but not *Euscelis plebejus* or *Macrosteles laevis*. The period of incubation of the virus in the plant is 40–45 days.

BAEUMER (K.). **Über die Wirkung von Rotklee- und Weidelgraswurzeln auf die Entwicklung von Trifolium pratense L. und Fusarium spec.** [On the effect of Red Clover and Welsh Ryegrass roots upon the development of *T. pratense* and *F.* sp.]—*Angew. Bot.*, **34**, 1, pp. 46–55, 1 fig., 1 graph, 1960.

The question of whether or not the parasitic swellings and lesions on roots and root collars of young red clover plants depend on the remnants in soil of previous crops was studied by the Inst. für Pflanzenbau und Pflanzenzüchtung, Univ. Göttingen, Germany. Red clover grown in pots of soil previously inoculated with a *F.* sp. was more widely infected if the soil contained red clover roots than if it contained *Lolium multiflorum* roots. The inhibitory effect of the latter was also demonstrated in a malt agar culture of *F.* Independently of the infection, the presence of red clover roots in soil increased the death rate of red clover plants later on. The germination of red clover seed in sterile extract from red clover roots reduced the number and the length of germinated plants to about ⅓ of that of plants germinated in the extract from Welsh ryegrass roots, which gave results only slightly inferior to the control (sterile water).

PEARSON (L. C.) & ELLING (L. J.). **Predicting disease resistance in synthetic varieties of Alfalfa from clonal cross data.**—*Agron. J.*, **52**, 5, pp. 291–294, 1960.

At the Dept of Agronomy and Plant Genetics, Minn. Univ., St. Paul, each of 3 synthetic lucerne vars. was compared with the average of all possible clonal crosses that could be produced from its parental clones to ascertain how accurately synthetic var. performance can be predicted from clonal cross data. Using resistance data for bacterial wilt (*Corynebacterium insidiosum*) [**37**, 102; **39**, 592] and common leafspot (*Pseudopeziza medicaginis*) [**38**, 412], the authors found that with both pathogens performances of the synthetic var. and the av. clonal cross agreed. It is thought that by crossing vars. offering good resistance to these 2 diseases, good combined resistance may be achieved.

FULKERSON (J. F.). **Pathogenicity and stability of strains of Corynebacterium insidiosum.**—*Phytopathology*, **50**, 5, pp. 377–380, 2 fig., 1960.

At U.S. Dept Agric., Beltsville, Md, tests of Du Puits lucerne for susceptibility to *C. insidiosum* [**39**, 114, 152, and above] indicated differences in pathogenicity between strs. of the organism, which appeared to lack cultural stability and often gave rise to variants. Of the lucerne clones used 7, readily self-fertile, gave $S_1$ seed, the populations from which were tested against the pathogen; 6 were as susceptible as their parent clones, 1 much more so. Some clones agronomically distinguishable were all equally susceptible.

MCVEY (D. V.) & GERDEMANN (J. W.). **Host-parasite relations of Leptodiscus terrestris on Alfalfa, Red Clover, and Birdsfoot Trefoil.**—*Phytopathology*, **50**, 6, pp. 416–421, 8 fig., 1960.

This information has been noticed [**39**, 233].

LEACH (C. M.). **Phytopathogenic and saprophytic fungi associated with forage Legume seed.**—*Plant Dis. Reptr*, **44**, 5, pp. 364–369, 1960.

At Ore. agric. Exp. Sta., Corvallis, previously described methods [**34**, 597] were used to examine 1,300 seed lots of field peas, lucerne, 4 spp. of clover, and 2 spp. of vetch for seed-borne fungi. The most frequently encountered were *Mycosphaerella pinodes* and *Botrytis cinerea* on field pea; *Phoma herbarum* var. *medicaginis* [**38**, 753], *Fusarium roseum*, and *Stemphylium botryosum* [*Pleospora herbarum*] on lucerne; *B. cinerea*, *F. roseum*, *P. herbarum*, and *Phoma trifolii* [**38**,

213] on alsike clover; *B. cinerea*, *F. roseum*, *P. trifolii*, *Sclerotinia sclerotiorum* [**38**, 10], and *Pleospora herbarum* on crimson clover; and *Ascochyta pisi* [**39**, 155] on hairy vetch (*Vicia villosa*). The infestation levels were generally low, and seed of red and ladino clovers and common vetch (*V. sativa*) in particular were relatively free from pathogens. Besides the parasites, 21 saprophytic fungi, mainly harmless, were isolated, 10 of them common to all 8 hosts.

Sidenko (I. E.). К обоснованию мероприятий по борьбе с ржавчиной Чины. [On the elaboration of methods for the control of Vetchling rust.]—Защ. Раст., Москва [*Zashch. Rast., Moskva*], **5**, 4, pp. 30–31, 1 fig., 1960.

Infection of vetchling [*Lathyrus*] by rust (*Uromyces pisi*) [cf. **38**, 448] reduces yield, especially in the Ukrainian steppe. Studies at the Central Selection exp. Sta., All-Union Inst. for Maize, Sinel'nikovo, Dnepropetrovsk district, showed that the aecidial state was on acrid and field milkwort [*Euphorbia* spp.]. Aecidiospores from *Euphorbia* inoculated with spores from vetchling infected 1 vetchling only, while those from *Euphorbia* inoculated with pea rust infected only pea. The vetchling rust, therefore, seems to be a biological form. Aecidia usually appear in the 2nd half of Apr. in the Ukrainian steppe. Opt. temp. for the germination of aecidiospores is 17–20°, their viability is 15–20 days. Proximity of vetchling to infected milkwort results in earlier and more severe infection. At 5 m. distance, for example, infection appeared on 9 June and was heavy on 90% of the plants at the end of the growth period, while at a distance of 1–1·5 km. symptoms appeared on 21 June with 6% weak infection. Milkwort, therefore, should be eradicated, especially near vetchling crops. Uredospores appear earlier on vetchling if there is rainfall in the 1st half of May and the av. temp. is ca. 20°. Early sown vetchling is liable to high infection. Infection is transferred from one *Lathyrus* sp. to others. Wild spp., e.g. tuberous vetchling (*L. tuberosus*), which serve as sources of infection, should therefore be destroyed. Teleutospores are formed when the plant reaches the end of the growth period, but also earlier if the temp. is maintained above 28 or below 15° for 10–12 days. They germinate best when overwintering with plant remains on the surface of the soil, or shallowly ploughed in.

Dorozhkin (N. A.) & Chekalinskaya (Mme N. I.). Развитие ржавчины **Uromyces lupinicola Bubak.** на различных видах люпина (**Lupinus luteus L., L. angustifolius L., L. polyphyllus Lindl.**). [The development of the rust *U. lupinicola* on different Lupin spp.]—Докл. Акад. Наук БССР [*Dokl. Akad. Nauk B.S.S.R.*], **4**, 4, pp. 179–180, 1 fig., 1960.

Studies at the Inst. Agric., Acad. Sci. Byelorussian S.S.R., showed that in some yr. *U. lupinicola* infects *L. luteus* and *L. angustifolius* severely and *L. polyphyllus* to a much less extent [cf. **36**, 6].

Bushkova (Mme L. N.). Поражаемость сортов Нута аскохитозом. [Susceptibility of Chick pea vars. to ascochytosis.]—Защ. Раст., Москва [*Zashch. Rast., Moskva*], **5**, 3, p. 55, 1960.

In summer 1953 almost all vars. of chick pea [*Cicer arietinum*] at the Krasnodar State Selection Sta. were infected by *Ascochyta rabiei* [**37**, 627]. Of the 273 vars. grown, Kubanskiĭ 16, which was taken as the standard, Krasnokutskiĭ 195, Krasnogradskiĭ 1, Ustoĭchivyĭ 2, and Askokhitoustoĭchivyĭ 1 were comparatively resistant. Mild infection occurred on Crimean, Dnepropetrovsk, and some Bulgarian and Indian vars. Work is being continued for the production of resistant vars.

Sturgess (O. W.) & Egan (B. T.). **A wilt disease of Velvet Bean caused by Phytophthora drechsleri Tucker.**—*Tech. Commun. Bur. Sug. Exp. Stas Qd* 1–4, pp. 9–13, 1960.

Several outbreaks of a stem rot and wilt (*P. drechsleri*) of *Stizolobium* [*Mucuna*

*deeringiana*] have occurred in Queensland recently [**37**, 308], and a description is given of the symptoms, host range of the fungus [cf. **39**, 146], and methods of spread. No genetic resistance to the disease could be found among cultivated vars. of *M. deeringiana* in field and greenhouse tests.

NIKOLAEVA (Mme M. I.). Микозы Бобов Эспарцета и меры борьбы с ними. [Mycoses of Esparcette Beans and control measures.]—Труд. Воронеж. Унив. [*Trud. Voronezh. Univ.*], **45**, 3, pp. 55–67, 1958. [Abs. in *Referat. Zh. Biol.*, *1960*, 9, p. 181, 1960.]

Phytopathological examination of 60 specimens of esparcette beans [*Onobrychis* spp.] of the 4 spp., vetch-leafed, Transcaucasian, *O. arenarius*, Don, and their hybrids, from 14 areas of the Voronezh region, yielded: *Alternaria tenuis*, *Fusarium bulbigenum*, *F. oxysporum*, *Penicillium citreo-roseum*, *P. coryophilum*, *Acrostalagmus cinnabarinus* [*Nectria inventa*], *Ascochyta onobrychidis*, *Aspergillus flavus*, *Trichothecium roseum*, and spp. of *Mucor*, *Rhizopus*, and *Thamnidium*. Good control was obtained by treating the beans with granosan at 3 kg./ton. Phytoncides from clematis, onion, and garlic were also tested, those of onion and garlic [**39**, 543] being the most effective.

PAPO (S.) & ARNSTEIN (Z.). **Mahalot ha-kemahon be'etse-peri.** [Powdery mildews of fruit trees.]—*Hassadeh*, **40**, 8, pp. 965–967, 6 fig., 1959. [Heb.]

This list from the Plant Protection Dept, Bureau Agric., Israel, with notes on the incidence and economic importance of each disease, includes *Podosphaera leucotricha* on apple, *P. oxyacanthae* on quince, *P. tridactyla* on apricot, *Sphaerotheca pannosa* on peach, *Uncinula necator* on vine, *Oidium mangiferae* on mango, and *O. ceratonia* on carob.

**Notes on research and investigation. Control of superficial scald of Apples.**—*Orchard., N.Z.*, **33**, 5, pp. 159–160, 1960.

Recent work by the Fruit Res. Sect. Div. and the Plant Diseases Div. on the use of diphenylamine (DPA) for the control of scald [see below] has shown that if it is sprayed on to trees shortly before harvest enough residue remains on the fruit to control scald in store. In a trial in 1958, as long as fruit was harvested within 48 hr. of spraying, reasonable control was obtained. The Chemical Engineering Sect., Dominion Lab., has developed a method of applying DPA on a commercial scale to loose fruit in cases, first spraying an oil emulsion then water to remove the oil, which causes damage if left on the skin, but leaving an adequate deposit of DPA on the apples. Fruit treated in this way is at present in store for later assessment.

**Notes on research and investigation.**—*Orchard., N.Z.*, **33**, 4, pp. 110–111, 1960.

The lightest rate of application of cyprex for the control of apple black spot [*Venturia inaequalis*: cf. **39**, 594], viz. ½ lb./100 gal. from green tip until the end of Nov., followed by captan, caused fruit russet and poor finish. Useful control of European canker [*Nectria galligena*: **5**, 105] was achieved by 2 applications of standard PMC [phenyl mercury chloride] formulations, one at late dormant and one just before leaf fall. It is recommended that this treatment be repeated for several seasons.

Bacterial spot [*Xanthomonas pruni*], previously only on plums, occurred in several peach orchards.

In further tests for the control of superficial scald [**39**, 234 and above] in Granny Smith apples picked at weekly intervals from 9 Apr.–21 May and cool stored until Nov., DPA [diphenylamine] at 1,000 p.p.m. gave complete control and also reduced core flush. The storage of oil-wrapped fruit [**38**, 606] at dual temperatures was also effective, with the exception of the first picking.

The incidence of collar rot [*Phytophthora cactorum*: loc. cit.] in Cox's Orange

trees at Nelson soil-treated with 4 lb. copper oxychloride increased by 11%, compared with 55% in the untreated. Increases for the ½ lb. treatments were 28% and for the 1 lb. 15%.

Bordeaux mixture (6–8–100) gave almost complete control of lemon verrucosis [*Elsinoe fawcettii*] when applied in Dec. and Jan. in each of 2 successive seasons, but dithane (½, 2, or 4 lb./100 gal.) was ineffective.

**Trunk and root-rot control.**—*Orchard., N.Z.*, **33**, 4, p. 119, 1960.

It has been shown that sporangia of *Phytophthora* [*cactorum*: see above] develop profusely on fallen fruit lying on the ground adjacent to apple trunks. Infected trees should be dug up in the autumn and the soil treated with 1 lb. Cu oxychloride dissolved in a little water.

Barnes (E. H.). **The role of phloridzin and other phenolic compounds in the host-parasite physiology of the Apple scab disease, incited by Venturia inaequalis.**—*Diss. Abstr.*, **20**, 7, pp. 2509–2510, 1960.

In a chromatographic study at Purdue Univ. of apple tissues infected by *V. inaequalis* the author found a fluorescent phenolic compound which increased in conc. in diseased tissues. He also obtained from the leaves a stimulatory principle, identified as phloridzin, which increased the growth of *V. inaequalis*. The conc. of the phenolic compound increased in the peel of fruits and in leaves of several infected apple vars.: conc. also increased in tissues infected by *Podosphaera leucotricha*. It was not present in culture filtrates of *V. inaequalis*, which when grown in the presence of phloridzin induced the production of only 1 breakdown product which stimulated its growth, viz. *p*-hydroxyphenylpropionic acid. It was concluded that utilization of this compound by *V. inaequalis* may be the basis of the stimulatory action of phloridzin.

Differential response of 3 races of the parasite to *m*-inositol was the only reaction which correlated with known genes for pathogenicity. The sporulation of isolates with the allele for avirulence on Geneva was inhibited, though this was not so with isolates possessing the allele for virulence.

All the compounds induced resistant reactions in host selections (derivatives of R 12740–7A, Russian) which are susceptible only to race 2 isolates, but not in host selections (Geneva) susceptible only to race 3 isolates.

The author concludes with the hypothesis that resistance is brought about by the products of the host-parasite interactions, in the initiation of which the parasite itself is instrumental.

Bilous (I. I.) Методика оцінки стійкості сортів Яблуні і Груші до захворювання паршею. [Methods for assessing resistance in Apple and Pear varieties to scab infection.]—Допов. Укр. Акад. сіл.-гос. Наук [*Dopov. Ukr. Akad. sil.-hos. Nauk*], **2**, 3, pp. 30–33, 1 fig., 1959. [Russ. summ.]

At the Ukrainian sci. Res. Inst. for Orchard Culture the assessment of apple and pear trees for resistance to scab [*Venturia inaequalis* and *V. pirina*: cf. **32**, 385] is based on 10 trees. The scale used grades the leaves 0–5, corresponding to 0, 5, 15, 30, 50, and > 65% leaf surface scabbed, 25 leaves from each of 4 sides of the crown being taken. Fruit infection is determined on the day of harvest on the trees used for assessing leaf infection (100 fruits from each tree), using the supplemented K. M. Stepanov (1932) scale, with indexes 0–4.

A visual method of assessment uses 20 typed trees for each var., equidistant and diagonally disposed. A 5 index scale (5 = no infection, 0 = very high) is used. Figures for leaves and fruit separately on each var. are worked as follows: (1) percentage of infected leaves and fruit, (2) av. index or percentage of infection of leaf or fruit, and (3) percentage development of the disease. Av. infection index

is calculated from each separate index which gives the quantity of infected leaves or fruit; the figure obtained for each index is multiplied by the corresponding index number; and the total of indexes is then divided by the no. of leaves or fruits on which the assessment was based. If the leaf or fruit index total is divided by the sum of infected leaves or fruit, the av. infection index for these can be calculated. Percentage development of the disease, $R$, is calculated from $R = \frac{S_b \times 100}{n \times c}$, where $S_b$ is the sum of the indexes, $n$ the quantity of leaves or fruit, and $c$ the highest assessment index (5 for leaves, 4 for fruit). Av. index for the visual method is found by multiplying the no. of infected trees for each index by the corresponding index, determining the sum of the indexes, and dividing it by the no. of trees of each var.

LAVEE (S.) & SAMISH (R. M.). **Resistance of Apple root-stocks to Sclerotium rolfsii (Sacc.)**—*Ktavim* (*Quart. J. agric. Res. Sta. Beit Dagan-Rehovot* [formerly *Rec. agric. Res. Sta. Rehovot*]), **10**, 1, pp. 5–13, 1 fig., 3 graphs, 1960.

Varietal resistance to *S. rolfsii* [**36**, 7] is essentially identical in plants grown in the field and in containers. Details are presented of a method whereby oxalic acid extracts from bark and wood, from branches of similar age, and from plants grown under the same conditions were used to culture *S. rolfsii*. The intensity of the resultant brown colour developing in the medium, possibly due to a phenolic compound, was found to be correlated with the degree of resistance of the plant extracted.

FULKERSON (J. F.). **Botryosphaeria ribis and its relation to a rot of Apples.** —*Phytopathology*, **50**, 5, pp. 394–398, 1 fig., 1960. [21 ref.]

A fuller account from N. Carol. State Coll., Raleigh, of studies already noticed [**37**, 289].

SMOLÁK (J.). **K černi Jablek.** [On black rot of Apple.] —*Ovocnář. Zelinář.*, **7**, 2, pp. 42–43, 1959. [Abs. in *Referat. Zh. Biol.*, *1960*, 11, p. 198, 1960.]

Melanosis in recent years has become widespread in Czechoslovakia, the disease appearing before harvesting as a sooty tarnish on the fruit, which quickly become rotten. Reinette de Baumann, Blenheim, and Zolotoĭ Parmen are severely infected. The causal agents of the disease were found to be *Cladosporium herbarum* [**29**, 30] and *C. cladosporioides*, and not *Leptothyrium pomi* or *Gloeodes pomigena*, as was previously thought. *C. herbarum* may be a parasitic form of *C. cladosporioides*. Spraying with Cu preparations is recommended.

HILKENBÄUMER (F.), BUCHLOH (G.), & ZACHARIAE (A.). **Zur Ätiologie der Stippigkeit von Apfelfrüchten.** [On the etiology of bitter pit of Apple fruits.]—*Angew. Bot.*, **34**, 1, pp. 38–45, 3 graphs, 1960.

In further studies at Inst. für Obstbau, Univ. Bonn, Germany [**39**, 423], the pitted parts showed considerably more total and protein N and notably less total Ca with a simultaneous relative rise of soluble Ca than healthy tissues. Citric acid in the pitted areas, which in Golden Delicious and Ontario was the only aliphatic carbon acid and in Cox's Orange the predominant one, is possibly associated with the changes in Ca metabolism.

ROSS (R. G.) & STEWART (D. K. R.). **Mercury residues on Apple fruit and foliage.** —*Canad. J. Pl. Sci.*, **40**, 1, pp. 117–122, 1 graph, 1960.

At the Canada Dept Agric., Kentville, N.S., most of the initial deposit of phenyl mercury acetate [cf. **38**, 89, 386] on apple leaves became water insoluble, its fungitoxicity declined, and the amount on leaves decreased rapidly in the first 2 weeks,

then more gradually in the next 2 months. Pre-cover organo-mercurials left negligible fruit residues, the av. residue at harvest on fruit receiving an early cover spray being 0·05 p.p.m., of which the seed, pulp, and peel contained 2, 57, and 41%, respectively. Applications at different dates produced no significant differences in deposit.

FISHER (E. G.), PARKER (K. G.), LUEPSCHEN (N. S.), & KWONG (S. S.). **The influence of phosphorus, potassium, mulch, and soil drainage on fruit size, yield, and firmness of the Bartlett Pear and on development of the fire blight disease.**—*Proc. Amer. Soc. hort. Sci.*, **73**, pp. 78–90, 1959.

Studies at Cornell Univ., Ithaca, N.Y., showed that development of fire blight [*Erwinia amylovora*] was increased by mulching and conditions of poor soil drainage but unaffected by P and K treatments.

CHRISTOFF [KHRISTOV] (A.). **Der Rost der Steinobstarten in Bulgarien.** [Stone fruit rust in Bulgaria.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 139–155, 1 pl., 1959. [Roman. summ. 40 ref.]

This survey from G. Dimitrov agric. Coll., Sofia, describes the geographical distribution of *Tranzschelia pruni-spinosae* [map 223; cf. **39**, 29], hosts, and weather conditions in relation to its 2 main forms, *typica* [*pruni-spinosae*] and *discolor* [**38**, 705].

ŽUKLIENĖ (R.) & DAGYTĖ (S.). **Slyvų sidabraligės parazitizmo klausimu.** [Concerning the parasitism of silver leaf of Plum.]—*Darb. Liet. TSR moks. Akad.*, Ser. C, *1960*, 1 (21), pp. 5–17, 7 fig., 1960. [Russ. summ.]

In 1957–8 in the Bot. Gdns, Inst. Biol., Kaunas, mycological and phenological studies were made on the collection of plum trees of 40 vars. (5 of each) planted in 1953–55 in identical soil conditions. External symptoms of silver leaf were seen on 28 and the causal agent was usually *Stereum purpureum* [map 30], though it was not always possible to obtain a culture from the diseased wood. This is due to the copious excretion of gum from infected plum, which inhibits the spread of the parasite in the wood. In 1957 it was only rarely that a culture of *S. purpureum* could be obtained from the wood of plum with silver leaf but with no external symptoms in the following yr. The following are comparatively resistant: Čirkšle No. 2, Torio ankstyvoji, Ferst, Opata, *Prunus hybrida*, Mėlynoji vėlyvoji, Italian vengrinė, Laxton's, Okia, Vengrinė, Naršinė mirabelė, Kozlovo juodslyvė, and Emma Leperman. Infection is reflected mainly in fruit yield and annular growth; sometimes the trees die. High incidence in the Bot. Gardens is favoured by wounds, damp soil, and the failure to clear the site of rotting wood, on which the fungus develops.

NYLAND (G.). **Heat inactivation of stone fruit ring-spot virus.**—*Phytopathology*, **50**, 5, pp. 380–382, 1960.

Further details are given from Dept Plant Path., Univ. Calif., Davis, of studies on peach ring spot virus [**37**, 91]. It was consistently inactivated in cherry and peach by treatment at 100° F. for 2 and 3 weeks, respectively, as also were cherry (sour) yellows, prune dwarf, peach necrotic leaf spot, Muir [peach] dwarf, and peach stunt viruses. The fact that none of these viruses was obtained in the absence of peach ring spot and that all were eliminated by the same treatment is considered to be further evidence that all are strs. of peach ring spot virus [**39**, 181].

PINE (T. S.) & WILLIAMS (H. E.). **Rio Oso Gem Peach seedlings as indicator hosts for the Prunus ring spot virus.**—*Plant Dis. Reptr*, **44**, 5, pp. 324–325, 1960.

At Calif. Dept Agric., Sacramento, 68 cultures of 'Prunus ring spot virus', i.e. the

virus inducing peach ring spot virus reaction in peach, as described by Cochran *et al.* [**21**, 85] and localized necrotic lesion reaction in Shirofugen flowering cherry as described by Milbrath *et al.* [**24**, 236], were inoculated by placing bark chips in Rio Oso Gem peach and simultaneously buds from the same stocks into Shirofugen cherry seedlings. Positive results were given by 63 sources on both hosts within a month. Mixed reactions of the remaining 5 cultures are considered due to the mildness of the strs. concerned.

Karle (H. P.). **Studies on yellow bud mosaic virus.**—*Phytopathology*, **50**, 6, pp. 466–472, 20 fig., 1 diag., 1960. [16 ref.]

At Univ. Calif., Davis, potted herbaceous plants were inoculated with peach yellow bud mosaic virus [cf. **39**, 117] and Bountiful bean [*Phaseolus vulgaris*], cowpea, cucumber, *Nicotiana rustica*, and tobacco used as indicators; greenhouse tests were made in cool weather because higher summer temps. masked symptoms. The virus was mechanically transmitted to 31 spp. and vars. of 10 families but could not be re-isolated from spp. of 5 others. Four original isolates (from raspberry, peach, Himalaya blackberry, and *Malva parviflora*) were classified as distinct strs. from the symptoms (in decreasing order of severity) on 20 test hosts. Interference was demonstrated in Lovell peach seedlings when a mild (blackberry) str. was budded, above or below, before a more severe one from peach. Of 13 weeds under infected peach trees only *M. parviflora* yielded the virus (from the roots), this being the 1st recovery from a herbaceous host in the field. Seed transmission could not be demonstrated in *Zinnia elegans* or bean. Transmission apparently took place through the roots, and did not occur through steamed soil [cf. loc. cit.] in which infected bean plants had grown.

Wright (W. R.), Smith (M. A.), Ramsey (G. B.), & Beraha (L.). **Observations on pustular spot on Peaches.**—*Plant Dis. Reptr*, **44**, 6, pp. 424–425, 1 fig., 1960.

In the Market Quality Res. Div, U.S. Dept Agric., Colorado peaches wound inoculated with *Clasterosporium carpophilum* [**38**, 522; cf. **39**, 330] and held at 75° F. displayed initial infections as small, scattered, water-soaked specks after 3 days, while peaches at higher and lower temps. were unaffected. After 1 week lesions were also observed on peaches at 70° and 80°, while those at 40° remained uninfected after 15 days. In another experiment initial infections appeared after 4 days at room temp. (59–75°, av. 68°), 5 at 80°, 6 at 54°, but none after 7 at 40°, though infection had, in fact, been established because it developed on transfer to a higher temp.

Šarić-Sabadoš (Ana) & Seiwerth (V.). **Olovna bolest Breskve u području sjevernog Jadrana.** [Silver leaf disease of Peach in the North Adriatic coastal area.]—*Zasht. Bilja* (*Plant Prot., Beograd*), *1959*, 54, pp. 87–92, 1 graph, 1959. [Engl. summ. 20 ref.]

Silver leaf, studied by Fac. Agric. Forestry, Zagreb, Yugoslavia, in several localities, appeared from mid-July, first on branches near the ground and facing S. The leaves contained numerous Ca oxalate crystals in the upper epidermis and 2·44% total N, compared with 4·35% in the healthy. Apart from the colour of the leaves the trees appeared healthy, but leaf fall started earlier than usual. The non-parasitic nature of this disease [cf. Pratella, **38**, 357] was demonstrated by chip-budding healthy trees of Elberta, Mayflower, Japan Golden, and Amsden vars. with diseased material, without effect. Observations over 3 yr. indicated a relation between incidence and the temp. and rainfall.

In contrast to this disease, referred to as 'late silver leaf', another type was observed near Medveja, with onset at the beginning of the growing period and characterized by somewhat thickened leaves with a rather milky gloss, a brownish

coloration of wood in the branches, and a general unthrifty appearance of the trees. *Phellinus* [*Fomes*] *igniarius* subsp. *pomaceus* [**39**, 236] was isolated.

Berend (I.). **Néhány új adat a Kajszibarackfák irreverzibilis hervadásos (verticilliózisos), állati kártévőktől származó és fagyas eredetű hirtelen pusztulásához.** [Some data on sudden death of Apricot trees, caused by verticilliosis, lesions by pests, and frost.]—*Magyar tud. akad. Agrár. oszt. közl.*, **14**, 1–3, pp. 135–144, 1958. [Abs. in *Referat. Zh. Biol.*, *1960*, 10, p. 201, 1960.]

In further studies at Budapest sci. Res. Inst. [**38**, 154] *V. dahliae*, usually accompanied by *Fusarium oxysporum*, was found in light, sandy soils to penetrate into the young roots through lesions caused by cockchafer larvae [*Melolontha vulgaris*]. If the trees had been weakened the disease spread rapidly and caused sudden death. Wilting and complete drying of the trees also resulted from lesions caused by the black wood-borer (*Capnodis tenebrionis*) and copper wood-borer (*Perotis lugubris*), whose larvae have been noticed on apricot roots since 1950. Drying and wilting symptoms can also develop from latent frost injuries.

Dingley (Joan M.). **Eutypa canker of Apricots.**—*Orchard.*, *N.Z.*, **33**, 3, pp. 78–79, 1 fig., 1960.

For a number of years symptoms similar to *Eutypa* canker have been observed in apricot orchards in N.Z. Cultures made from discoloured wood of diseased branches collected from orchards at Heathcote, near Christchurch, in the late autumn of 1958 were similar to those of *E. armeniacae* [**39**, 330] and were pathogenic when inoculated into seedling apricot trees. Wood from Heathcote placed under a hedge at the Plant Diseases Div., D.S.I.R., Auckland, in May 1958 developed small black fruiting bodies by the end of Mar. 1959 in the few places where bark had been removed; they were identical with those of *E. armeniacae*. The disease is unlikely to become serious in N.Z. as climatic conditions favourable for its spread in Australia are not common in N.Z.

Hutton (K. E.) & Kable (P. F.). **Brown rot of stone fruits.**—*Agric. Gaz. N.S.W.*, **71**, 5, pp. 236–237, 247, 1 fig., 1960.

Following brief notes on the symptoms and control of *Sclerotinia fructicola*, spray programmes for apricot, cherry, peach, nectarine, plum, and prune are given. Thiram is the only available safe fungicide in N.S.W. to use on apricot trees in foliage.

Lott (T. B.) & Keane (F. W. L.). **Twisted leaf and ring pox viruses found in Chokecherries near diseased orchards. Twisted leaf virus indigenous in Chokecherry. Some seedlings of the Van Cherry found to be superior to Bing as indicators for the twisted leaf virus.**—*Plant Dis. Reptr*, **44**, 5, pp. 326–327; 328–330, 1 map; 331, 1 fig., 1960.

At Res. Sta., Canada Agric., Summerland, B.C., wild chokecherry (*Prunus virginiana* var. *demissa*) [*P. demissa*] was shown to carry apricot ring pox virus [**39**, 600], often without symptoms, and [cherry] twisted leaf virus [loc. cit.] without symptoms in the Okanagan and Similkameen Valleys.

The authors consider that infected chokecherries may be responsible for the appearance of twisted leaf in cherry orchards where no other source of infection can be discovered.

Twisted leaf virus sometimes failed to produce symptoms in inoculated Bing sweet cherry when it did on Van, which may therefore be a better indicator.

Milatović (Ivanka). **Nova zapažanja o prezimljenju parazitske gljive 'Cylindrosporium padi' (Lib.) Karst u Jugoslaviji.** [New comments on the over-

wintering of the parasitic fungus *Higginsia hiemalis* in Yugoslavia.]—*Zasht. Bilja* (*Plant Prot., Beograd*), *1959*, 55, pp. 101–103, 1 pl., 1959. [Engl. summ.]

At Fac. Agric. Forestry, Zagreb, stromata were found in Mar. and Apr. in the lower surface of overwintered sour cherry leaves infected by *H. hiemalis* [**38**, 155; **39**, 268] near the acervuli; macroconidia, present on both surfaces in May and June, are believed to cause primary infection in spring.

Gilmer (R. M.). **A blight of ground Cherry and Russian Almond seedlings caused by Gloeosporium fructigenum Berk.**—*Plant Dis. Reptr*, **44**, 6, p. 395, 1960.

*G. fructigenum* [*Glomerella cingulata*] caused a lethal tip blight of young seedlings of *Prunus fructicosa* and *P. tenella* grown from seed from Morden, Man. It proved to be seed-borne and able to withstand mild surface sterilization (2 min. in chlorox).

Schuch (K.). **Die Brennesselblättrigkeit der Schwarzen Johannisbeere.** [Reversion virus disease of Black Currants.]—Reprinted from *Rhein. Mschr. Obstb.*, *1960*, 4, 1 p., 1960.

A record by the Institut für Obstkrankheiten, Heidelberg, Germany, of black currant reversion virus [cf. **36**, 654] on var. Silvergieter in the Trier region.

Schofield (Elizabeth R.). **Black Currant leaf spot and its control in the West Midlands.**—*Agriculture, Lond.*, **67**, 4, pp. 250–252, 1960.

Premature defoliation of black currant is caused principally by *Pseudopeziza ribis* [**37**, 95] and may result in a loss of up to 25% of the subsequent year's crop. The most susceptible vars. are Baldwin and Wellington, while Mendip Cross, Laxton's Grape, and September Black are slightly less so. Baldwin is less susceptible if heavily manured and moderately severely pruned. When the currants are to be used for syrup the type of fungicide used for control is restricted. Spray trials over 2 yr. indicated that zineb at 2 lb. 75% wettable powder 100 gal. water at 200 gal. acre gives better results than captan ($1\frac{1}{2}$ lb. 50% wettable powder) at the same rate. A programme of 4–5 pre-picking zineb sprays followed by 1 after picking reduced leaf spot by 40 60%. If this is not practicable, a spray in mid-May, one in early June, and another after picking should be adequate.

Zuckerman (B. M.). **Studies of two Blueberry stem diseases recently found in Eastern Massachusetts. Fungi collected from Blueberry stems in Massachusetts.** —*Plant Dis. Reptr*, **44**, 6, pp. 409–415, 11 fig.; p. 416, 1960.

Sporulation of *Fusicoccum putrefaciens* on *Vaccinium corymbosum* [**39**, 29] occurs over a longer period in Mass. than in Canada, and may make the disease more difficult to control.

A description is given of *Coryneum microstictum* [**39**, 426]. Infection studies suggest that it is a wound parasite and is not serious on vigorous bushes. Ferbam, ziram, and phenyl mercury lactate failed to give control.

Among other fungi newly recorded on *V. corymbosum* stems were *Rhabdospora oxycocci*, *Pezizella lythri*, *Macrophoma* sp., *Karschia lignyota*, and *Septoria* (?) *vaccinii*.

**Anthracnose of berry fruits.**—*Agric. Gaz. N.S.W.*, **71**, 3, pp. 143, 163, 1 fig., 1960.

A description of the symptoms and control of anthracnose (*Elsinoe veneta*) [cf. **35**, 689], the most common disease affecting loganberry, youngberry, and boysenberry in coastal and tableland areas of N.S.W.; raspberry also is susceptible.

Stace-Smith (R.). **Studies on Rubus virus diseases in British Columbia. VI. Varietal susceptibility to aphid infestation in relation to virus acquisition.**—*Canad. J. Bot.*, **38**, 3, pp. 283–285, 1960.

In further studies at Canada Dept Agric., Vancouver, B.C. [cf. **37**, 728], field populations of *Amphorophora rubi* were observed for 4 yr. on 13 vars. of raspberry.

Lloyd George and St. Walfried were immune, Malling Enterprise and Malling Promise resistant, and the rest susceptible. Each var. was naturally infected by black raspberry necrosis virus, which was acquired with difficulty from the immune vars. and the susceptible var. St. Regis, and readily from the rest.

MELLOR (F. C.) & FORBES (A. R.). **Studies of virus diseases of Strawberries in British Columbia. III. Transmission of Strawberry viruses by aphids.**—*Canad. J. Bot.*, **38**, 3, pp. 343–352, 1960. [21 ref.]

In further studies from Univ. B.C., Vancouver [cf. **31**, 499], 11 aphid spp. commonly found on rosaceous plants were tested as vectors of 8 strawberry viruses. *Amphorophora rubi*, *Aphis rubifolii*, *Aulacorthum solani*, *Macrosiphum rosae*, *Myzus ascalonicus*, *M. ornatus*, *M. persicae*, *Pentatrichopus fragaefolii*, *P. tetrarhodus*, and *P. thomasi* transmitted the veinbanding virus [cf. below]. *P. fragaefolii*, *P. tetrarhodus*, and *P. thomasi* transmitted a mild str. of mottle, while only *P. fragaefolii* and *P. thomasi* transmitted curly-dwarf mottle [cf. **38**, 217]. *M. rosae* transmitted veinbanding and possibly mild yellow edge. *Aphis forbesi* failed to transmit any. None transmitted witches' broom, crinkle, or strawberry latent-A virus [str. of strawberry latent virus].

The most efficient vectors were *P. fragaefolii* and *P. thomasi* and veinbanding and mottle were the most readily transmitted viruses. *M. ornatus* and *P. thomasi* transmitted veinbanding from 1 British Sovereign strawberry plant, but not from another, while *P. fragaefolii* transmitted it from both.

FRAZIER (N. W.). **Differential transmission of four strains of Strawberry vein banding virus by four aphid vectors.**—*Plant Dis. Reptr*, **44**, 6, pp. 436–437, 1960.

At the Dept Entomol. Parasitol., Univ. Calif., Berkeley, 4 strs. of strawberry veinbanding virus [**35**, 29; **38**, 217] were transmitted by *Pentatrichopus fragaefolii*, *P. thomasi*, and *P. jacobi*; an atypical clone of *P. fragaefolii*, previously reported in error to be *P. thomasi*, failed to transmit the type strain.

McGREW (J. R.). **Strawberry diseases.**—*Fmrs' Bull., U.S. Dep. Agric.* 2140, 24 pp., 14 fig., 1959.

This bulletin, superseding No. 1891 [cf. **21**, 463], includes 30 diseases.

SCHMIDLE (A.) & KRCZAL (H.). **Die Krankheiten und Schädlinge der Erdbeere und ihre neuzeitliche Bekämpfung.** [Diseases and pests of Strawberry, and their up-to-date control.]—*Erwerbsobstbau*, **2**, 5, pp. 92–96, 3 fig., 1960.

Brief notes from the Institut für Obstkrankheiten, Heidelberg, Germany, on *Phytophthora cactorum* [**35**, 904], *Botrytis cinerea* [**39**, 430], and *Sphaerotheca humuli* [loc. cit.] are included.

VARNEY (E. H.), MOORE (J. N.), & SCOTT (D. H.). **Field resistance of 29 additional Strawberry varieties and selections to Verticillium, 1959.**—*Plant Dis. Reptr*, **44**, 5, pp. 370–371, 1960.

Further valuations (tabulated) at N.J. agric. Exp. Sta., N.B. [cf. **38**, 611], revealed considerable varietal differences in resistance to *V. alboatrum*. Only Cavalier (Valentine × Sparkle) and Siletz (hybrid of 2 Ore. selections) were entirely free from severe symptoms.

RISHBETH (J.). **Factors affecting the incidence of Banana wilt ('Panama disease').** —*Emp. J. exp. Agric.*, **28**, 110, pp. 109–113, 1960.

In a glasshouse experiment at the Bot. Sch., Univ. Cambridge, with Gros Michel banana, characteristic wilt symptoms appeared 6 weeks after inoculation with

*Fusarium oxysporum* f. *cubense* [**37**, 174; cf. **39**, 605] in rapidly growing plants for which soil moisture was maintained at a steady and moderately high level, but not in plants subjected to fluctuating soil moisture. Response to K fertilization, as evidenced by leaf analysis, was appreciable when soil aeration was good, but undetectable when it was poor. Disease severity appeared to be inversely related to K uptake. The possibility of improving K uptake by mature plants sufficiently to induce wilt resistance offers some difficulty in practice: an initial experiment, in which the plants received liberal K and the soil was regularly watered with dilute hydrogen peroxide, was not successful. An outbreak of wilt in the hitherto resistant var. Lacatan, growing on alluvial soil in Jamaica, is under study. The persistence of symptoms in the absence of obvious predisposing factors, such as temporary waterlogging or heavy N fertilization, is puzzling and potentially serious. There was no difference in root-infecting ability between an isolate from Lacatan and a typical Gros Michel isolate [cf. **36**, 477].

NEWCOMBE (MARGARET). **Some effects of water and anaerobic conditions on Fusarium oxysporum f. cubense in soil.**—*Trans. Brit. mycol. Soc.*, **43**, 1, pp. 51–59, 1960.

At the Dept Cryptogamic Bot., Univ. Manchester, an isolate of *F.o.* f. *cubense* [cf. above] from the Cameroons was used to infest an unsterilized English loam soil containing no indigenous *F.* spp. Colonization of banana leaf pieces, sterilized with propylene oxide and used as bait, indicated more than mere survival of the fungus, which was for at least 8 months. In flooded soil colonization was lowered from 55% after 1 week to 3 after 12 weeks, but use of aerated and non-aerated flooding water showed this not to be due to lack of O. As the fungus maintained activity for 3 months after reinoculation of the soil it was clear that no toxin had been formed. In soil flooded with water containing $CO_2$ colonization of bait almost ceased after 16 weeks. The fungus grew well on glass tape [**31**, 394] in the soil, but both flooding and $CO_2$ inhibited the formation of chlamydospores. Apparently it is the lack of these which finally eliminates the fungus, $CO_2$ causing continued germination of spores, with no formation of chlamydospores or replenishment of inoculum.

PRICE (D.). **Climate and control of Banana leaf spot.** –*Span*, **3**, 3, pp. 122–124, 2 graphs, 1960.

It was established by the Cameroons Development Corporation that spraying with oil reduces banana fruit weight, especially in hot, sunny weather. When a banana leaf severely diseased by *Mycosphaerella musicola* [cf. **39**, 481] was kept continually wet it produced only 1 discharge of ascospores whereas a similar leaf which was alternately wetted and dried produced 17 discharges in the same period. Losses from *M. musicola* were heaviest just before and just after the rainy season, i.e. when sunny periods alternated with heavy showers. Spray programmes were therefore drawn up with the aid of hythergraphs for each month, in which the no. of days with more than 0·2 in. rain (roughly the amount needed to wet an old banana leaf) was plotted against the no. with more than 1 hr. sunshine (the amount required to dry it). The peak times for ascospore discharge probably occur 1 to 2 months before the times of greatest fruit rejection, which are in the rainy months. In the southern Cameroons pure naphthenic oil is sprayed from aircraft and ground machinery at 7 or 8 pints/acre at fortnightly intervals in the spraying seasons.

PEREIRA (H. F.), DE FIGUEIREDO (E. R.), & HUSSNI (J.). **A 'cercosporiose' da Bananeira, sua ocorrência no Estado de São Paulo — experiências e combate.** [Cercosporiosis of Banana, its occurrence in the State of São Paulo –experiments and control.]—*Arq. Inst. biol., S. Paulo*, **25**, pp. 161–184, 1 col. pl., 16 fig., 1 diag., 1958. [Engl. summ. Received Apr. 1960.]

Following a brief review of the occurrence of banana leaf spot (*Mycosphaere lla*

*musicola*) in São Paulo [**33**, 98], the results of tests with 5 fungicides for its control are reported. Bordeaux mixture (1:1:100 + 0·2% triton X-114) proved to be the best, followed by banacobre [**34**, 382], also very effective; nirit, fermate, and dithane were unsatisfactory.

Blake (C. D.) & Chalker (C. F.). **Cercospora leaf spot and speckle of Bananas.**—*Agric. Gaz. N.S.W.*, **71**, 3, pp. 121–125, 164, 6 fig., 1960.

A general description of the symptoms of banana leaf spot [*Mycosphaerella musicola*] and speckle disease (*Sphaerella* [*M.*] *musae*) [**39**, 372]. Low-vol. spray misting with 1½–2 gal./acre of a suitable mineral oil at 3-weekly intervals is recommended, commencing in early Jan. and continuing until the end of May, with addition of a compatible Cu oxychloride (2 lb.), cuprous oxide (1¼ lb.), or 65% zineb (1 lb.), which gives some control of speckle.

Meredith (D. S.). **Some observations on Trachysphaera fructigena Tabor & Bunting, with particular reference to Jamaican Bananas.**—*Trans. Brit. mycol. Soc.*, **43**, 1, pp. 100–104, 1 pl., 1960.

Noticed from another source [**39**, 434].

Ruehle (G. D.). **The Florida Avocado industry.**—*Bull. Fla agric. Exp. Sta.* 602, 100 pp., 44 fig., 1958. [Received Aug. 1960.]

This bulletin on all aspects of avocado production [cf. **21**, 210] includes a section on diseases (pp. 74–89). The most important pathogens are *Cercospora purpurea* [**39**, 79], *Colletotrichum gloeosporioides* [*Glomerella cingulata*], *Sphaceloma perseae* [loc. cit.], *Diplodia natalensis*, *Diaporthe citri*, and *Phytophthora cinnamomi* [**37**, 295]. A spray table gives concs. and times of application of Cu fungicides to control the first 3 and powdery mildew (*Oidium* sp.). Other diseases encountered include algal spot (*Cephaleuros virescens*), sun blotch virus [**38**, 534], and deficiencies of Zn, Fe, and B.

Aragaki (M.) & Ishii (M.). **Fungicidal control of Mango anthracnose.**—*Plant Dis. Reptr*, **44**, 5, pp. 318–323, 1 graph, 1960.

Full details are given of tests on the control of *Colletotrichum gloeosporioides* [*Glomerella cingulata*: **37**, 546] at the Exp. Farm, Univ. Hawaii, Honolulu, in 1955 and 1957; 7 sprays of captan, or captan with 2 zineb sprays at flowering ensured the highest healthy fruit: yield ratio in Haden, a moderately susceptible var., while captan was more efficient than zineb on the susceptible Wootten. Applications were made at 1–3-week intervals and a wetting agent, triton B-1956 or 60-L (60% alkyl aryl Na sulphonate) at 6 oz./100 gal., was added to some treatments.

**Brown spot of Passion Fruit.**—*J. Agric. W. Austr.*, Ser. 4, **1**, 7, pp. 609–611, 4 fig., 1960.

In most areas of the State severe outbreaks of *Alternaria passiflorae* have occurred. All above-ground parts of the vine are attacked and recommended control measures [**36**, 200] include pruning and spraying.

**Atlas chorob a škůdců kulturních rostlin. Díl X. Atlas chorob a škůdců Chmele.** [Atlas of diseases and pests of cultivated plants. Part X. Atlas of diseases and pests of Hops.]—67 pp., 26 col. pl., Prague, Czechoslovak Academy of Agricultural Sciences, 1959. 29 Kčs (bound).

This vol. is the joint work of J. Melichar (artist) and B. Starý (scientific editor). The excellent, folio-size illustrations of the symptoms and pathogens are each accompanied by descriptions, data on occurrence and research, and notes on the problems involved. The section on diseases includes non-parasitic disorders, viroses

[**30**, 76 *et passim*] (curl disease [**39**, 482], infectious sterility [hop nettle head virus], hop mosaic [**38**, 612], [hop] vein mosaic, chlorotic disease, and virus leaf deformation), an unidentified bacteriosis, and fungal diseases (*Gibberella pulicaris* and *Pseudoperonospora humuli*).

MAIER (C. R.). **Streptomycin absorption, translocation, and retention in Hops.**—*Phytopathology*, **50**, 5, pp. 351–356, 6 graphs, 1960.

Information from Ore. State Coll., Corvallis, already noticed [**38**, 760; cf. **39**, 607].

MOLNÁR (G.), FARKAS (G.), & KIRÁLY (Z.). **Védekezési kisérletek Mentarozsda (Puccinia menthae Pers.) ellen nikkel-sókkal.** [Control of Mint rust (*P. menthae*) with Ni salts.]—*Növénytermelés*, **9**, 2, pp. 175–180, 1960. [Russ., Engl., Germ. summ.]

At Res. Inst. for Medicinal Plants and Res. Inst. for Plant Protection, Budapest, spraying with 0·1–0·3% $Ni(NO_3)_2$ or $NiCl_2$ [cf. **38**, 506] gave very efficient control [cf. **38**, 220] on peppermint leaves extensively covered with pustules, with resultant increased leaf and oil yield. Menthol content was not affected by $NiCl_2$, but was reduced by about 15% by $Ni(NO_3)_2$.

WILSON (K. I.). **A new host of Colletotrichum necator from Kerala.**—*Sci. & Cult.*, **25**, 10, pp. 604–605, 1 fig., 1960.

The pathogen was found by the agric. Coll., Vellayani, Trivandrum, India, on *Dioscorea triphylla*, a weed in plantations of pepper (*Piper nigrum*) [cf. **19**, 494], its regular host.

**Potato production.**—*Rhod. agric. J.*, **57**, 1, pp. 52–68, 3 fig., 1960.

In the section on diseases by G. W. HERD (pp. 63–67) 8 fungus diseases [**34**, 771; **36**, 380; **39**, 211], 2 bacterial diseases [**38**, 295], 3 physiological disorders, and 3 virus diseases [**34**, 436] are described.

BRETAN (CECILIA), CONSTANTINESCU (ECATERINA), FELECAN (V.), & BRETAN (I.). **Studiul agrobiologic al soiurilor de Cartof din collecția stațiunilor Cluj și Măgurele.** [Agrobiological study of Potato vars. from the collections of Cluj and Măgurele Stations.]—*Anal. Inst. Cerc. agron. Român.*, Ser. C, **26** (*1958*), pp. 171–192, 2 diag., 1959. [20 ref. Russ., Fr. summ.]

Of 83 vars. tested, Katahdin, Aquila, Frühmölle, Alpha, Mittelfrühe, Maikönig, and *Phytophthora*-resistant from U.S.S.R. were most resistant to *Solanum* virus 2 [potato virus Y], potato leaf roll, potato aucuba mosaic and its str. *S.* virus 8, and tomato stolbur viruses; Robusta, Aquila, and *P.*-resistant most resistant to blight (*P. infestans*); and Săpunar, Roz de toamnă, Viola, and Frühbote most susceptible to blight. In respect of potato wart (*Synchytrium endobioticum*) it was confirmed that hybrids between resistant vars. are the most resistant (80–100%), those between susceptible vars. the most susceptible.

KÖHLER (E.). **Die Viruskrankheiten der Kartoffel, nach dem gegenwärtigen Stand der Forschung.** [Virus diseases of Potato according to the present stage of research.]—*Angew. Bot.*, **34**, 1, pp. 1–27, 1960. [8½ pp. ref.]

This paper is a brief survey of recent discoveries and views of the relevant problems, and is conceived as expanded and systematically arranged annotations to the appended bibliography. The 1st section contains descriptions and a classification of the viruses, including potato leaf roll, X-mosaic [potato virus X], forms of viruses Y, S, and tobacco ring spot, potato stem mottle, potato aucuba (viruses F and G), [tomato] stolbur, and others. The 2nd section, devoted to diagnostic problems, is followed by sections on pathological physiology and epidemiology, and accounts of control and resistance build-up.

**Virus diseases of Potatoes.**—*Agric. Gaz. N.S.W.*, **71**, 4, pp. 193–198, 8 fig., 1960.

Covers the symptoms and control of the main virus diseases of potatoes in N.S.W. [cf. **35**, 355; **38**, 564]. 'Seed' stocks practically free from virus infection are available to growers.

Leont'eva (Mme Y. A.). Влияние сорта на поражаемость Картофеля вирусными болезнями. [The effect of variety on the infection of Potato by virus diseases.]—Изв. Куйбышев. сел.-хоз. Инст. [*Izv. Kuibȳshev. sel-khoz. Inst.*], *1958*, 13, pp. 193–200, 1958.

In tests in 1953–56 at the exp. farm of the Kuibȳshev agric. Inst. only 6 potato vars. out of 50 combined high yield with increased resistance to virus diseases, of which the most widespread in the region are potato rugose mosaic [virus Y], streak mosaic [virus X], leaf deformation [cf. **37**, 502], and [tomato] stolbur wilt. Av. infection in 1954–56 (spring sowing) in improved Rannyaya Roza [**39**, 337] was 21·9, Volzhanin 30·3, Belo-rozovȳĭ 23, Viola 17, Erlaine 15·3, and Ul'yanovskiĭ 31·6%; av. yields were 187·9, 183·1, 189·1, 149·8, 134·8, and 151·9 centners ha., respectively. The use of summer reproduction tubers for seed brings about a considerable reduction of susceptibility to mosaics in all vars. with spring sowing. All potato vars. except Volzhanin are resistant to stolbur wilt and only very mildly susceptible (0–3%) to mosaics and deformation with systematic summer sowing.

Jermoljev (E.) & Průša (V.). **Posuzování zdravotního stavu Bramboroných hlíz stanovením kalóz fluorescenčnĕmikroskopickou metodou.** [Evaluation of the health of Potato tubers by determination of callose by the fluorescence-microscopic method.]—*Ann. Acad. tchécosl. Agric.*, *1959*, 3, pp. 401–408, 1959. [Russ., Germ., Engl. summ. Abs. in *Referat. Zh. Biol.*, *1960*, 10, p. 200, 1960.]

The preparation by State Inst. Plant Production, Ruzyně, Czechoslovakia, of fluorochrome reacting specifically with callose and its use for the diagnosis of virus diseases by the detection of callose plugs in sieve-tubes and phloem are described. The results are as exact as those obtained from the resorcin blue method [**39**, 33]. The formation of callose is particularly provoked by the viruses of [potato] leaf roll, [?] streak, and mosaic, irrespective of var.

Shcherbakova (Mme N. M.). Определение вируса скручивания листьев Картофеля. [The determination of Potato leaf roll virus.]—*J. agric. Sci., Moscow*, **5**, 6, pp. 127–129, 1960.

The Igel'-Lange method, widely adopted in E. Germany for identifying infected potato tubers, was used with inoculation at the All-Union Inst. for Plant Culture to determine leaf roll infection. A stain such as risol (1 g. resorcinol in 100 ml. distilled water) [cf. above] is mixed with 1 ml. 30–35% ammonia water; the solution turns yellowish then greenish. It should be kept for 2 weeks before use in daylight when access to O causes it to turn blue. Tubers are stored for a similar period before testing (3 or 4 sections from each tuber) at 18° C. as necroses are then more sharply apparent after staining. Phloem areas in the pith, which in some vars. frequently stain blue, and necroses immediately adjacent to the stolon trace are not of diagnostic importance.

In the summer 1958 field plants of 32 vars. and hybrids (externally healthy and with mild and severe symptoms of infection), including samples of local production obtained in different yr. from different regions of the U.S.S.R. (Far East, Latvian, and Estonian S.S.R.), as well as from England, Hungary, and Germany were tested. Mild and severe symptoms of leaf roll were noted in 23 of the 32, and phloem necrosis in all except var. Fol'genling. The 9 sample tubers which appeared externally healthy or with vague symptoms of infection had no phloem necrosis. This again confirms the high percentage (96%) of agreement of the results obtained by

lab. analysis by the Igel'-Lange method with those from field assessment. Infection of indicator plants was also used to determine the presence of the virus by grafting on healthy Sieglinde. Leaf roll was found to occur frequently in many vars. together with various mosaic viruses. It is especially widespread in the Far East, having been detected in a comparatively large number of Far Eastern samples. It was established that in plants with clear symptoms of leaf roll callose was nearly always present in the phloem. The Igel'-Lange method should be used for initial selection of 'seed' material and for assaying seed potatoes of unknown origin.

Silberschmidt (K. M.). **Types of Potato virus Y necrotic to Tobacco : history and recent observation.**—*Amer. Potato J.*, **37**, 5, pp. 151–159, 2 fig., 1960. [17 ref.]

This paper, presented at the 43rd Annual Meeting of the Potato Ass. of America, Univ. N.B., Fredericton, has been noticed in abstract [**39**, 239].

Bagnall (R. H.). **Potato virus F latent in an imported variety and resistance to the virus in an interspecific Potato hybrid.**—*Phytopathology*, **50**, 6, pp. 460–464, 6 fig., 1960. [22 ref.]

At Canada Dept Agric., Fredericton, N.B., a virus recovered from symptomless Albion potato plants (a Dutch var.) and from F 451 seedling with severe necrosis proved to be potato virus F [potato aucuba mosaic virus str.]. In host range studies 31 spp. of Solanaceae all became infected except *Solanum capsicastrum*, but *S. miniatum* [cf. **39**, 438] reacted only mildly and no better indicator than *Capsicum annuum* was found. Neither *S. miniatum* nor *C. annuum*, however, was reliable when potato virus X was present. The reactions of several potato vars. and seedlings are described. P.I. 19772 (Epicure × 4 n *S. chacoense*) was highly resistant, more so than any commercial var. inoculated.

Howard (H. W.) & Wainwright (J.). **Potato virus M and paracrinkle.**—*Nature, Lond.*, **186**, 4729, pp. 993–994, 1960.

At the Plant Breeding Inst., Trumpington, Cambridge, sap from King Edward potatoes inoculated to *Chenopodium album* gave symptoms similar to those [induced by sap] from Arran Victory infected by potato virus S [cf. **39**, 34], and on *Datura metel* gave systemic yellow spotting followed by an acropetal leaf-drop which proved fatal.

Sap from plants obtained by grafting King Edward on Saco (immune from S) gave no symptoms on *C. album* but produced potato virus M symptoms on *D. metel*. Scions from these Saco plants produced potato paracrinkle symptoms in Arran Victory whether infected or not by S. It is concluded that paracrinkle symptoms in Arran Victory are produced by the virus M component alone of the King Edward complex.

Klindić (Olga) & Buturović (Delveta). **Stolbur i njegov značaj za kulturu Krompira u NR Bosni i Hercegovini.** [Stolbur and its importance for the cultivation of Potato in the People's Republic of Bosnia and Hercegovina.]—*Zasht. Bilja* (*Plant Prot., Beograd*), *1959*, 55, pp. 37–49, 1959. [Engl. summ. 17 ref.]

A general note from the Inst. agric. Res., Sarajevo, Yugoslavia, on the wilting of seed potatoes in many areas, max. in mid Aug., and caused primarily by [tomato] stolbur virus [cf. **38**, 74; **39**, 611 *et passim*]. The presence of the vector, *Hyalestes obsoletus*, was observed, and also the association with infected *Convolvulus arvensis*.

Roze (K. K.). Генеалогия фитофторостойких гибридов Картофеля Латвийской ССР. [The genealogy of Potato hybrids resistant to *Phytophthora* in the Latvian S.S.R.]—*Ex* Труд. Конференции «Наследственность и Изменчивость

Растений, Животных и Микроорганизмов», Том. II [Trans. Conference 'Heredity and Variability of Plants, Animals, and Micro-organisms', Vol. II], Moscow, Acad. Sci. U.S.S.R., pp. 660–663, 1959.

Resistance to *Phytophthora* [*infestans*: **39**, 121, 188] is one of the main requirements for potato selection in the Baltic region. In Latvia initial forms used for producing immunity have been derived from the U.S.S.R. and Germany (W vars. and others). A number of valuable interspecific resistant lines were produced at the Inst. Biol., Acad. Sci. Latvian S.S.R., such as V. 2000–6, V. 4155–7 (V. 2000 × Gladstone), V. 4445–45, V. 5018–2, and V. 5018–4, all with cultivated tuber form. V. 2000–6 produces frost resistant haulms (to −4° C.) with an increased protein content (2·8–3·2% raw protein), while the last 2 have a high tuber yield and higher starch content. V. 5018–2 (produced from 6 component spp.) is also resistant to viruses X and Y in the field. From these interspecific hybrids the following resistant high yielding and relatively early vars. were bred at the Priekul'skaya Selection Sta.: 8401 (V. 5018–2 × Agra), 8925 (V. 4445–45 × Priekul'skiĭ ranniĭ), 9259 (V. 5018 × Kameraz), 9262·1 (V. 5018–2 × Priekul'skiĭ urozhaĭnyĭ), 9183 (V. 4155–7 × Agronomicheskiĭ), and others.

Hughes (J. C.) & Swain (T.). **Scopolin production in Potato tubers infected with Phytophthora infestans.**—*Phytopathology*, **50**, 5, pp. 398–400, 1960.

Studies at the Nat. Inst. agric. Bot. and Low Temp. Res. Sta., Cambridge, England, showed that blue fluorescent zones surrounding areas of potato tissue inoculated with *P. infestans* were caused by a 10–20 fold increase of scopolin. An increase of chlorogenic acid [**39**, 614] in the same region was only 2–3 fold.

Yamamoto (M.), Yasumori (H.), Tatsuyama (K.), & Okada (T.). **Change of the activities of oxidative enzymes in Potato tubers by the invasion of Phytophthora infestans.**—*Forsch. PflKr., Kyoto*, **6**, 4, pp. 117–125, 3 graphs, 1959. [Jap. summ. 24 ref.]

At the Shimane agric. Coll., Matsue, Japan, the respiration of potato tissue invaded by *P. infestans* [**37**, 735; **39**, 340] increased more rapidly in the resistant var. Kennebec than in the susceptible Irish Cobbler. Respiration in both healthy and diseased tissue was inhibited strongly by several chemicals, especially $Na\ N_3$, which affects the cytochrome oxidase system. In Irish Cobbler the inhibition ratio decreased 6 days after inoculation. Catechol oxidase activity increased at the inoculation sites and polyphenol was detected in Kennebec tissues, in max. conc. 2–4 mm. from the point of inoculation.

Bojňanský (V.). **Ekológia a prognóza rakoviny Zemiakov Synchytrium endobioticum.** [Ecology and prognosis of Potato wart *S. endobioticum.*] 230 pp., 13 fig., 10 graphs, 2 maps, Bratislava, Publishers of the Slovak Academy of Sciences, 1960. 11.60 Kčs. [9 pp. ref. Russ., Germ., Engl. chapt. summ.]

The author summarizes the results of his previous studies [**38**, 274 and below] and surveys the potato wart situation in Europe, with special regard to Czechoslovakia. After two chapt. (pp. 15–36) reviewing the history of the disease, the data of experiments in 3 localities in Slovakia (2 in a dry, hot, and low-lying area, 1 in a humid area and at a high altitude) are presented (pp. 37–91); they indicate that dry conditions are less favourable for the disease. An outline of the behaviour of the disease in the various countries of Europe (pp. 92–128) is followed by an account of ecological factors (pp. 129–162), including temp., season, humidity, soil, and agricultural practices. Finally (pp. 163–218) some practical issues are discussed, including prognosis, problems of potato breeding, quarantine, and conclusions pertinent to agriculture in Czechoslovakia and elsewhere at the present time.

Bojňanský (V.). **Die Bewertung des Kartoffelkrebsvorkommens in der Rumänischen Volksrepublik vom Standpunkte der Umweltbedingtheit des Parasiten Synchytrium endobioticum (Schilb.) Perc.** [Evaluation of the incidence of Potato wart in the Romanian People's Republic from the viewpoint of environmental conditions for the parasite *S. endobioticum*.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 73–81, 4 maps, 1959. [Roman., Russ. summ. 12 ref.]

The author examines the published data and concludes that the disease is likely to be more severe at altitudes over 500 m. and in localities where rainfall is 700–1,000 mm./yr., av. July temp. is 14–20°, and yearly temp. 4–8° C. [cf. **39**, 121 and above].

Červenka (J.), Nohejl (J.), & Šimek (J.). **Příspěvek k otázce vlivu sucha a vlivu ozáření radioizotopem $Co^{60}$ na infekční schopnost sporangií rakoviny Bramborové (Synchytrium endobioticum Schilb. [Perc.]).** [A contribution to the problem of the influence of drought and the influence of the radioisotope $Co^{60}$ radiation on the infectious ability of the sporangia of Potato wart (*S. endobioticum*).]—*Ann. Acad. tchécosl. Agric.*, *1959*, 3, pp. 395–400, 1959. [Russ., Germ., Engl. summ. Abs. in ***Referat. Zh. Biol.***, ***1960***, 10, p. 200, 1960.]

At the sci. Res. Inst., Havlíčkův Brod, Czechoslovakia [cf. above] spores were able to infect var. Vol'tman after being 5 yr. in dry fallow soil. Exposure of warts to radiation [**39**, 438], even at max. dosage 247,860 r., did not diminish virulence.

Săvulescu (Alice) & Drimus (Rodica). **Oprirea încolţirii Cartofilor în timpul depozitării prin folosirea unor preparate chimice.** [Use of various chemicals for prevention of Potatoes from sprouting during storage.]—*Anal. Inst. Cerc. agron. Român.*, Ser. C, **26** (*1958*), pp. 57–72, 4 pl., 7 fig., 1959. [Russ., Fr. summ.]

Application of 100 g. active solanex (50% act. methylic ester of α-naphthylacetic acid)/2 kg. talcum powder/1,000 kg. stored potatoes proved effective, especially with vars. Săpunar, Ackersegen, and Sabina, in reducing losses by 12%. However, solanex, like bikartol, showed no inhibitory effect on *Penicillium*, *Aspergillus*, *Mucor*, or *Fusarium* spp. in culture. On the other hand, belvitan K, which failed to prevent sprouting, was fungicidal, while agermin was slightly inhibitory or fungistatic.

Duncan (J.) & Généreux (H.). **La transmission par les insectes de Corynebacterium sepedonicum (Spieck. & Kott.) Skaptason et Burkholder.** [Transmission of *C. sepedonicum* by insects.]—*Canad. J. Pl. Sci.*, **40**, 1, pp. 110–116, 1960.

In further similar tests [**39**, 494] at the Canada Min. Agric., Quebec, it was demonstrated that in addition to the Colorado beetle (*Leptinotarsa decemlineata*) [cf. **39**, 535], leafhoppers (particularly *Macrosteles fascifrons*), the ternate bug (*Lygus lineolaris*), aphids, particularly *Myzus persicae*, several spp. of Cercopidae, and the flea-beetle (*Epitrix cucumeris*) could carry the bacterium. Healthy plants were root inoculated with a suspension of crushed insects from infected plants, or with macerated leaves of plants that had harboured the insects, or else insects were allowed to move from the diseased to healthy plants. With the exception of the flea-beetle all these spp. transmitted infection to the stems of potato plants, which produced some infected tubers, but exhibited no other symptoms; only an occasional transmission by Colorado beetle resulted in wilting of the stalk in the next generation.

Paquin (R.), Santerre (J.), Généreux (H.), & Coulombe (L. J.). **Essai de différents produits chimiques comme désinfectants des éclats (germes) de Pommes de terre inoculés avec Corynebacterium sepedonicum.** [Test of different

chemical products as disinfectants of Potato seed pieces inoculated with *C. sepedonicum*.] –*Canad. J. Pl. Sci.*, **40**, 2, pp. 383–387, 1960. [Engl. summ.]

The most effective control (93 to 98%) of bacterial ring rot (*C. sepedonicum*) [**39**, 188] in potato seed pieces tested with 47 chemicals was afforded by a 10-min. dip in acidified $HgCl_2$ (2:1,000 + 1% HCl) in comparative studies at Min. Agric., Ste.-Anne-de-la-Pocatière, Que.

Nielsen (L. W.) & Pope (D. T.). **Resistance in Sweet Potato to the internal cork virus.**—*Plant Dis. Reptr*, **44**, 5, pp. 342–347, 1960.

At N. Carol. State Coll., Raleigh, of 43 clones, core-grafted with Porto Rico infected by sweet potato internal cork virus [cf. **39**, 241], 32 developed various degrees of internal root necrosis, viz. 93% in Porto Rico, 85% in 262–27 ((98 × Yellow Strasburg) × (Yellow Yam O.P. × Nancy Hall)), 70% in 150 (mutant of L-69 (Porto Rico × 47742)), and as little as 1% in some of the clones. Of the 11 clones in which no internal root necrosis was found, 7 produced infection (1 of them 100%) when back-grafted to virus-less Porto Rico roots, 3 were doubtful, but H.M.-2 ((Creole × Porto Rico) × Porto Blanco) caused none. The extreme range of responses suggests that genetic factors of the particular clones are involved in the development of internal necrosis and in virus multiplication within the plant tissue. The progeny from susceptible Porto Rico × resistant H.M.-15 ((Porto Rubio selfed) O.P.) were 40 susceptible clones, 17 symptomless carriers, and 3 resistant to virus multiplication: of 36 clones from the resistant parent selfed 5 were susceptible, 10 symptomless carriers, and 21 resistant.

Kantack (E. J.), Martin (W. J.), & Newsom (L. D.). **Relation of insects to internal cork of Sweet Potato in Louisiana.**– *Phytopathology*, **50**, 6, pp. 447–449, 1960.

Studies at La State Univ., Baton Rouge, showed that max. field infection of sweet potato with internal cork virus [**39**, 496] occurs during peak flights of *Aphis gossypii* [**37**, 677] and in La no other insect has been shown capable of transmitting the virus. *Myzus persicae* and *Macrosiphum solanifolii* [*M. euphorbiae*], reported as vectors elsewhere [**38**, 161], were scarcely present when much of the infection took place. Most plant-to-plant spread apparently occurs in the field rather than in mother beds.

Slade (D. A.). **Black rot an important disease of Kumaras.**—*N.Z.J. agric.*, **100**, 4, pp. 375–378, 1 fig., 1960.

Black rot (*Ceratostomella* [*Ceratocystis*] *fimbriata*) [map 91; cf. **38**, 622 *et passim*] of kumara [sweet potato] is increasing in severity in Auckland Province since the first occurrence in 1947. No N.Z. vars. are resistant and control can only be achieved by the use of clean seed, treatment of propagating beds with formalin drenches or chloropicrin, and practising a 3-yr. crop rotation. Tubers from disease-free areas only should be stored.

**Host list of plant diseases recorded in the South East Asia and Pacific Region. Hevea brasiliensis—Rubber.** –*Tech. Docum. FAO Plant Prot. Comm. S.E. Asia* 7, 2 pp., 1960. [Cyclostyled.]

Published by the FAO Regional Office, Bangkok, Thailand.

Antoine (R.). **Cane diseases.**—*Rep. Sug. Ind. Res. Inst. Mauritius, 1959*, pp. 53–60, 2 pl. (6 fig.), 1960.

This report [cf. **38**, 625] notes a severe, local outbreak of rind disease or sour rot (*Pleocyta sacchari*), related more to poor soil conditions than to the cane var. The new cane vars. M. 202/46 and M. 93/48 are susceptible to [sugarcane] chlorotic

streak [virus]. The Australian vars. Q. 44 and Q. 57, recently released from quarantine, contracted gumming disease (*Xanthomonas vasculorum*). An outbreak of 'pseudo-Fiji' disease of sugarcane on the west coast of Madagascar is reported: galls, on the lower surface of the leaves, were also found on *Pennisetum purpureum* near by and the epidemiology of the disease did not otherwise tally with true Fiji disease of sugarcane.

**Twenty-seventh Conference, Cairns, Queensland, 20–26 Apr. 1960.** -*Proc. Qd Soc. Sug. Cane Tech.*, **27**, 261 pp., numerous fig., graphs, etc., 1960. 42*s*.

S. Greenaway (pp. 139–143) gave a brief outline of the history of chlorotic streak [**39**, 344 and below] in the Mackay area.

A preliminary report on the control of yellow spot (*Cercospora koepkei*) [**35**, 328] by dusting with Cu oxychloride was made by B. T. Egan (pp. 145–148). Results indicated that more attention must be paid to cloud cover and relative humidity in developing a forecasting system.

The mosaic disease campaign [**39**, 344] in the Farleigh-Habana area of the Mackay district discussed by E. A. Pembroke (pp. 149–154) is resulting in a decrease in incidence.

Sturgess (O. W.). **Studies with chlorotic streak disease of Sugar Cane. I. Introductory nutrient solution studies.**—*Tech. Commun. Bur. Sug. Exp. Stas Qd* 1–4, pp. 15–19, 1960.

A more detailed account of the transmission of chlorotic streak through nutrient solutions independently of root contact [**39**, 191].

Egan (B. T.) & Steindl (D. R. L.). **A basal stem and root rot of Sugar Cane.**—*Cane Gr. quart. Bull.*, **23**, 4, pp. 130–131, 1 fig., 1960.

Sugarcane in several areas of Queensland has recently been affected by a stem and root rot of young plant cane, which usually recovers sufficiently to produce a crop, though some plants are killed. Diseased plants are stunted and have stiffened leaves with more or less severe white striping following the vascular bundles. The root system is poorly developed and partially rotten and white mycelium is visible on the base of the stem and on the roots. Affected canes are more common in those parts of a field least favourable for growth. The disease has been observed mainly in Trojan and Q. 67, but also occurs in Badilla, Q. 63, and L. 622. An unidentified white fungus has been consistently isolated from affected tissue and has reproduced the disease on inoculation.

Van der Zwet (T.). **Studies on Phytophthora seed piece rot of Sugarcane and the principal causal organism P. megasperma Drechs.**—*Diss. Abstr.*, **20**, 7, pp. 2485–2486, 1960.

The 'sterile' *P.* isolate [**39**, 345] causing seed piece rot of sugarcane was induced to produce oogonia at La State Univ. by growing it on sterilized oat grains. The fungus was then identified as *P. megasperma* [map 157]. Initial infection of the seed pieces takes place at the root primordia and buds at each node. C.P. 36–13 was more susceptible than P.O.J. 213 or Co. 290. From the results obtained in an extensive var. field test in the winter and spring (1957–8, 1958–9) it is concluded that the C.P. lines 28–19, 34–120, 36–13, 44–154, 53–1, 53–15, 53–22, and 53–30 are susceptible, whereas Co. 281, N.Co. 310, and the C.P. lines 29–116, 43–47, 44–101, 47–193, 48–103, and 51–21 are resistant.

In a survey made in the spring of 1958 higher percentages of *Phytophthora* cultures were obtained from seed pieces planted between late Sept. and Nov. than from those planted earlier.

Singh (G. R.). **Studies on the development and spread of red rot in a Sugarcane plant.**—*Diss. Abstr.*, **20**, 7, p. 2484, 1960.

In field-grown plants at La State Univ. the av. recovery of the red rot fungus [*Glomerella tucumanensis*: cf. **39**, 192] from leaf scars, leaf sheaths, and internal tissues of plant and stubble shoots during 1957–59 was 23·1, 28, and 1·4%, respectively. The buds of underground parts of shoots had up to 22·3% infection and scales 26·3%. Leaf scars and internal tissues of the underground stubble pieces of canes planted in Aug., the shoots of which had been killed during the winter, also gave red rot.

Shoots grown in the greenhouse from field-inoculated seed cane became infected. Isolations from leaf scars, leaf sheaths, growing points, and internal rolled leaves gave 17·9, 5, 3·9, and 1% red rot, respectively, whereas from shoots of non-inoculated seed cane the same parts gave, respectively, 4·3, 5·8, 1·5, and 0·2%.

Uninjured, inoculated mid-ribs of greenhouse plants developed pin-point lesions. From leaf sheath inoculations in the greenhouse 1st symptoms were noted within 24 hr. on leaf sheaths, and lesions developed within 6 or more days on the blades (or after 48 hr. when injured before inoculation). The fungus was frequently recovered from apparently healthy leaves taken from the field late in the season.

Prakasam (P.) & Sarma (M. N.). **Influence of host contact on the germination of Sugarcane smut spores.**—*Sci. & Cult.*, **25**, 11, pp. 644–645, 1960.

Studies at the Sugarcane Res. Sta., Anakapalle, A.P., revealed the beneficial influence of the products of exosmosis from sugarcane buds on germination of smut spores [*Ustilago scitaminea*: **37**, 418].

Abe (T.) & Kono (M.). **Studies on the anthracnose of Tea bush. IV. On the sporulation, germination, and infection of conidia of the anthracnose fungi.**—*Sci. Rep. Kyoto Univ. Agric.* (formerly *Sci. Rep. Fac. Agric. Saikyo Univ.*) 11, pp. 38–43, 2 fig., 1959. [Jap. Abs. from Engl. summ.]

In this contribution [cf. **39**, 40] on 4 fungi from tea, *Gloeosporium theaesinensis* and *Glomerella cingulata* are stated to produce abundant conidia after 10 days on autoclaved tea leaves while *G.* sp. and *Guignardia camelliae* were only beginning to form spores after 16 days. *Glomerella* sp. required sun- or electric light for conidial production on potato extract agar but not on autoclaved tea leaves or oat meal agar. The germination of *Gloeosporium theae-sinensis* was accelerated by the addition of glucose to distilled water. Within 24 hr. of inoculation on tea leaves conidia of *G. theae-sinensis* formed appressoria, after 72 hr. infection hyphae were observed in epidermal cells, and after 96–120 hr. a vesicle formed at the tip of the infection hypha.

The germination of *Glomerella cingulata* conidia was 13% and 54% after 6 and 12 hr., respectively; 12 hr. after inoculation 10% formed appressoria on both glass and tea leaves. After 24 hr. epidermal cells of tea leaves were infected, and palisade cells after 72–120 hr.

Mulder (D.) & De Silva (R. L.). **A forecasting system for blister-blight control, based on sunshine records.**—*Tea Quart.*, **31**, 2, pp. 56–67, 5 graphs, 1960.

The results are given of a field trial on 5 estates in Ceylon of reducing spray rounds against tea blister blight [*Exobasidium vexans*] when sufficient hrs. sunshine were recorded [**39**, 346] during the preceding 5-day period. The average number of rounds saved varied from 2·5 to 11 and in only 1 instance was the percentage infection appreciably greater than in the controls which received the usual spray schedule. It is concluded that the method could be adopted with advantage, even in the worst blister blight areas.

MULDER (D.) & DE SILVA (R. L.). **Deficiency diseases and the symptoms of magnesium deficiency.**—*Tea Quart.*, **30**, 4, pp. 157–165, 1 col. pl., 1959.

The symptoms of Mg deficiency in tea in Ceylon [**34**, 551; cf. **39**, 40] are described and the lit. is reviewed. Symptoms are intensified by bright light and high rainfall. The most sensitive indicators of the condition are clones TRI 2024, TRI 2023, Court Lodge CL 72 and CL 26, and Moray 23, while TRI 2025 is more resistant. Chlorosis disappeared almost completely after 8 weekly sprayings with 10% $MgSO_4$.

PAVELLARD (J.). **L'influence de divers virus sur la teneur en auxine des Tabacs.** [The influence of several viruses on the auxin content of Tobacco.]—*Congr. sci. int. Tabac*, **1**, pp. 658–668, 1955. [*Biol. Abstr.*, **35**, 11, p. 2684, 1960.]

A study of the reciprocal action of viruses and auxins showed that virus-infected plants contain, in every organ, markedly less auxins than similar healthy ones. After inoculation virus multiplication entails a considerable diminution of auxin level, especially in the mature leaves, followed by an inhibition of growth in height. There is no satisfactory explanation for this effect.

SUKHOV (K. S.) & KAPITSA (Mme O. S.). Фазы развития и изменчивость фитопатогенных вирусов. [Phases in the development and variability of phytopathogenic viruses.]—*Ex* Труд. Конференции «Наследственность и Изменчивость Растений, Животных и Микроорганизмов». Том. I [Trans. Conference 'Heredity and Variability of Plants, Animals, and Micro-organisms', Vol. I], Moscow, Acad. Sci. U.S.S.R., pp. 338–341, 1959.

Further researches at the Inst. of Genetics, Acad. Sci. U.S.S.R. [**36**, 170; **39**, 42], showed that multiplication of tobacco mosaic virus in *Nicotiana glutinosa* begins 1–2 hr. after infection at opt. temp. and continues in each infected cell for 9–10 hr. The subsequent dormant phase begins only when the cell is saturated with virus. Change to the 2nd phase appears to be due to the exhaustion of the substrates needed for multiplication, or to the accumulation of metabolic products, inhibiting further multiplication.

MENEGHINI (M.). **O emprêgo de discos de folhas de Nicotiana glutinosa para determinar a atividade das suspensões de virus do mosaico do fumo.** [On the use of leaf disks of *N. glutinosa* to determine the activity of Tobacco mosaic virus suspensions.]—*Arq. Inst. biol.* (*Def. agric. anim.*), *S. Paulo*, **25**, pp. 83–93, 3 fig., 1958. [Engl. summ. Received Apr. 1960.]

This paper describes a method whereby a number of 16 mm. diam. disks are cut from *N. glutinosa* leaves, inoculated with tobacco mosaic virus, and kept in a moist chamber for 2–3 days, the object being to enable a series of comparative studies with virus suspensions of different conc. to be made on the same leaf.

SHIMOMURA (T.) & HIRAI (T.). **The effect of pyrimidines and 5-phenylazopyrimidines on the multiplication of Tobacco mosaic virus.**—*Phytopathology*, **50**, 5, pp. 344–346, 1960. [11 ref.]

Further studies at Fac. Agric., Nagoya Univ., Anzyo, Aichi-Ken, Japan [cf. **39**, 348] showed 2,4,6-triamino-5-phenylazopyrimidine to inhibit the multiplication of tobacco mosaic virus in excised tobacco leaf disks, the inhibition being irreversible by thymine, uracil, or cytosine. The mechanism involved is considered to be distinct from that by which the same compound inhibits bacterial growth.

BLATTNÝ (C.). **Beitrag zur Kenntnis der Koexistenz von Stämmen des VTM in Physalis franchettii und der Reisolation dieser Stämme.** [Contribution to the knowledge of the coexistence of strains of Tobacco mosaic virus in *P. fran-*

*chettii* and the reisolation of these strains.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 67–71, 1 fig., 1959. [Roman. summ. 10 ref.]

The substance of this paper has been noticed [cf. **38**, 191].

Berger (P.) & Müller (Brigitta). **Tabakrippenbräune bei den Sorten Geudertheimer III und Havana IIc.** [Tobacco vein-browning in the vars. Geudertheimer III and Havana IIc.]—*Ber. Inst. Tabakforsch. Dresden*, **6**, 2, pp. 221–230, 3 fig., 1 diag., 1959. [Russ., Engl. summ.]

A tabulated report is given on experimental studies at the Institut für Tabakforschung, Dresden, Germany, to elucidate the steady spread since 1957 of vein-browning [str. of potato virus Y] in the above-mentioned cigar tobacco vars. [**38**, 101], formerly regarded as resistant. Both vars. reacted very variably to inoculation with isolates M 1 and R 1 of the virus, the symptoms in some plants being reminiscent of 'mauche' [loc. cit.] while in others they were typical of vein-browning. Yet other plants harboured the virus (as demonstrated by back-testing) with no external symptoms. The variable reactions of Geudertheimer persisted throughout 7 further series of tests. During winter the inoculated plants developed the extensive necrotic foci typical of vein-browning.

Silber (G.) & Heggestad (H. E.). **Black shank of Tobacco in Pennsylvania and some observations on the pathogen.**—*Plant Dis. Reptr*, **44**, 5, pp. 303–305, 1960.

A note from U.S. Dept Agric., Beltsville, Md, on *Phytophthora parasitica* var. *nicotianae* [cf. **39**, 500], the spread of which is outlined, and which has gradually extended north in the U.S.A. A Pa isolate was as virulent or more so on Burley 21, Wilson, Swarr-Hibshman, and Dixie-Bright 101 as isolates from N. Carol. and Beltsville.

Davide (R. G.) & Orillo (F. T.). **Biological test of fungicidal spray stickers on the control of Cercospora leaf spot on Tobacco.** *Philipp. Agric.*, **43**, 6, pp. 386–396, 1 fig., 1959.

At the Central Exp. Sta., Laguna, the number of lesions of *C. nicotianae* was significantly reduced by spraying with orthocide 50 W with the stickers rubber latex (14%), Goodrite P.E.P.S., Orthocide Sticker 1017 and 1935, Shell Tenac, Dupont Spreader Sticker, or Goodrite X-75 [**39**, 215] compared with orthocide 50 W, Bordeaux, or Spraycop 340 alone, all with artificial rain applied by sprinkler at 4 l./plant. The best treatments at 3 l. and 4 l. artificial rain were with the rubber latex and P.E.P.S. stickers. The former was compatible with orthocide 50 W, parzate, ziram, flit 406, and fermate, but with manzate caused slight burning.

Messiaen (C. M.), Arnoux (M.), & Lafon (R.). **Essais de traitements fongicides sur Tomates réalisés par l'I.N.R.A. en 1959.** [Tests of fungicidal treatments on Tomatoes conducted by the I.N.R.A. in 1959.]—Reprinted from *Bull. tech. Ing. Serv. agric.* 147, 16 pp., 9 fig., 1 diag., 1960. [22 ref.]

From spraying trials against *Alternaria solani*, *Phytophthora infestans*, and *P. parasitica* [cf. **37**, 248] on tomatoes in 1959 at the Sta. de Pathologie Végétale du Sud-Ouest, La Grande Ferrade, Gironde, and at the Sta. de Pathologie Végétale du Sud-Est, Domaine Saint-Maurice, Vaucluse, it is concluded that Cu mixtures (200–250 g. Cu/hl.) are very active against *P. infestans* and moderately so against *A. solani*. Zineb is efficacious against *A. solani*. Thiram appears to be insufficiently active against *A. solani*, while against *P. infestans* it is no better than zineb. Maneb appears to be at least as active as zineb against *A. solani* and more so against *P. infestans*. Against all 3 diseases growers are advised to alternate treatments with organic and cupro-organic materials. Pneumatic spraying appeared to improve

the fungicidal effect of the products tested. If spray warnings were issued for *P. infestans* and *P. parasitica* the use of Cu could be reduced to a min.

DOEPEL (R. F.). **Black spot of Tomatoes.** *J. Agric. W. Austr.*, Ser. 4, **1**, 5, pp. 383-385, 3 fig., 1960.

Black spot (*Alternaria solani*) [**36**, 494] is the most serious foliage disease of tomato in the State. Seed should be immersed in water at 126° F. with 0·25% formalin (1 fluid oz./2½ gal.) for 25 min. and spread to dry, then dusted with an organic Hg preparation before planting. New or sterilized soil should be used for the seed-beds and plants should be sprayed with zineb (2 lb./100 gal.) at intervals of 10 days, or 5 under weather conditions favourable to the disease.

HUSAIN (A.) & DIMOND (A. E.). **Role of cellulolytic enzymes in pathogenesis by Fusarium oxysporum f. lycopersici.**—*Phytopathology*, **50**, 5, pp. 329–331, 3 graphs, 1960.

At Conn. agric. Exp. Sta., New Haven, cellulase was found in culture filtrates of a highly pathogenic str. of *F.o.* f. [*F. bulbigenum* var.] *lycopersici* grown on cotton linters, wood cellulose, filter paper, or carboxymethyl cellulose as the sole C source, added at 1% to modified Richards' solution + 0·01% yeast extract. With 1·5% glucose very little of the enzyme was produced, but it was obtained on living tomato stem (½ in.) sections in water and activity was max. in cultures on chopped tomato stem as the C source. Purified preparations of the cellulase (cf. *Arch. Biochem. Biophys.*, **43**, pp. 255–268, 1953) wilted young tomato cuttings completely in 20 hr. The enzyme is active at pH 2–9 (opt. *c.* 6) and is inhibited by Hg but not by Cu, Zn, or Mn ions. In pathogenesis [**39**, 50] the cellulase apparently induces wilt, its hydrolytic products serve as nutrients for *F*, and it may facilitate the spread of the pathogen from the vascular tissue in later stages of the disease.

TETEREVNIKOVA-BABAYAN (Mme D. N.). Фузариальное увядание Помидоров в условиях Армянской ССР. [*Fusarium* wilt of Tomatoes in the conditions of Armenian S.S.R.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 1–10, 1959. [Roman. summ. 27 ref.]

This paper from Erevan State Univ. deals with specific problems of *F.* wilt (*F. bulbigenum* var. *lycopersici* and other *F.* spp.) and lists a number of resistant and susceptible vars.

SCHMITTHENNER (A. F.). **The relationship of growth, pectolytic, and cellulytic activity to pathogenic variation among isolates of Colletotrichum phomoides and related fruit rotting fungi.** *Diss. Abstr.*, **20**, 7, pp. 2515–2516, 1960.

At Ohio State Univ. the pathogenicity of 20 isolates of *C. phomoides*, *C. lagenarium*, and *Glomerella cingulata* from various fruits was determined on fruits of 23 Plant Introduction tomato lines. Of 8 isolates selected as representing the range in pathogenicity, 2 (*C. lagenarium*) were least pathogenic, 2 (*G. cingulata*) moderately so, and 4 (*C. phomoides*) more so. The rate of growth of a representative isolate of *C. lagenarium* was much less than that of *C. phomoides* or *G. cingulata*. The *C. lagenarium* isolate was not very virulent even when colonizing tomato fruits, perhaps in part because of its inherently slow growth rate. Its pectolytic activity was poor and its cellulytic activity nil, whereas these activities in the *G. cingulata* isolate were strong though it was unable to colonize the fruits of 1 tomato line. Toxicity appeared to play a part; the isolate seemed to be more sensitive to this toxic effect than were the others. The *C. phomoides* isolate was pectolytically and cellulytically active. It failed to colonize 1 tomato line, however, and it is possible that the production of the pectolytic and cellulytic enzymes by the fungus is inhibited in the tomato. One *C. phomoides* isolate was only slightly active pectolytically and another was not cellulytically active, though both were pathogenic.

White (L. S.). **The incidence and enzymatic activity of molds found in Indiana and Ohio Tomatoes.**—*Diss. Abstr.*, **20**, 8, pp. 3026–3027, 1960.

Field and laboratory work at Mich. State Univ. indicated that the widespread tomato moulds *Alternaria solani* and *Colletotrichum phomoides* often produced only minor lesions on fruits, while *Oospora*, *Rhizopus*, *Fusarium*, and *Mucor* spp., which are generally less frequent in the field unless the temp. and humidity are high, were the most active agents of rot. Tomatoes inoculated with *Rhizopus* sp. developed cracks. Juice from trimmed tomatoes always had a higher mould count (cf. Howard & Stephenson, *Bull. U.S.D.A. Bur. Chem.* 581, 1917) than juice from those which did not require trimming. High mould counts were occasionally obtained where visible rot was minimal, and vice versa. Thus the Howard mould count [**37**, 216] is not necessarily correlated with the amount of visible rot: it is the type of mould present which is decisive.

The highest polygalacturonase activity was found in the tomato tissue and juice samples infected by the most active rot-producing moulds, and the conc. of this enzyme ran closely parallel with the activity of the most active agents of rot. This did not hold true for cellulase.

Nayudu (M. V.) & Walker (J. C.). **Bacterial spot of Tomato as influenced by temperature and by age and nutrition of the host.**—*Phytopathology*, **50**, 5, pp. 360–364, 1960.

A more detailed account of studies on *Xanthomonas vesicatoria* already noticed [**39**, 247].

Edlin (H. L.) & Nimmo (M.). **Tree injuries. Their causes and their prevention.** [vi]+167 pp., 125 fig., London, Thames & Hudson, 1956.

This useful, informative, and well-illustrated book gives semi-popular accounts of all the principal types of tree injuries. Chapt. 7 (pp. 113–133) deals with fungal damage.

Steyaert (R. L.). **Bīmārīhā-yi darakhtān-i jangalī.** [Diseases of forest trees.]—165 pp., 65 fig., 1952–3.

This monograph, compiled during the author's service in Persia, primarily for the College of Silviculture, was translated into Persian by A. Minūchihri and Q. Sharīf, with a number of additions. A brief introduction and notes on forest ecology are followed by notes on pathogens and diseases, arranged in taxonomic order of the former.

Spaulding (P.). **Diseases of foreign forest trees growing in the United States.**—*Agric. Handb. U.S. Dep. Agric.* 139, 118 pp., 1958. [Received July, 1960.]

This publication is a companion to that dealing with N. American forest trees abroad [**35**, 796] and is similarly arranged. An appendix annotates major American tree diseases potentially dangerous abroad.

Kristensen (H. R.). **Virussygdomme hos forstplanter.** [Virus diseases in forest nursery trees.]—*Dansk Skovforen. Tidsskr.*, **45**, pp. 155–166, 1960. [27 ref.]

Information is summarized on a number of viroses not yet known to occur in Denmark, where the only ones definitely determined are poplar mosaic [cf. **39**, 630] and ring mosaic of *Sorbus aucuparia*, reported in 1955 and 1956, respectively, though suspicious symptoms have also been observed on beech, ash, and oak. In *S. aucuparia* the leaf surfaces are practically filled with very conspicuous, yellow-green, ring-shaped, angular, sometimes coalescent spots, forming large complexes.

**Annual Report of the Forest Insect and Disease Survey, Canada Department of Agriculture, 1959.**—121 pp., 6 maps, 1960.

In the foreword to this report [cf. **38**, 717] it is noted that during 1959 Dutch elm disease [*Ceratocystis ulmi*: **37**, 601; map 36] extended its range farther north in Ont., in Que. and in west-central N.B.

From Newfoundland W. J. Carroll & A. G. Davidson (pp. 15–16) note that in some areas 50–75% of the balsam firs [*Abies balsamea*] were affected by winter drying. Over 10% black spruce [*Picea mariana*] in the Upper Humber area were damaged by *Armillaria mellea*.

A. G. Davidson & W. R. Newell (pp. 32–35) report anthracnoses of broad-leaved trees in the Maritime Provinces, including *Gloeosporium apocryptum* on maple, *G. fagicola* on beech, *G. aridum* on ash, and *G. quercinum* on red oak [*Quercus rubra*]. New records include *Rhizosphaeria kalkhoffii* on white spruce [*Picea glauca*].

In Que. G. B. Ouellette (pp. 41–43) observed bark cracking and reddening of the needles in balsam fir. At Valcartier 10% red spruce [*P. rubens*] seedlings were killed by *Phacidium infestans* [**37**, 115]. New records included ? *Chrysomyxa weirii* on black spruce, *Plagiostoma populi* on poplars, *Dothichiza populea* on hybrid poplars, and *Mycosphaerella populicola* on *Populus trichocarpa*.

The results of surveys of maple dieback [**38**, 717] in Ont. are described by J. Reid & H. D. Griffin (pp. 63–67).

H. Zalasky (pp. 79–80) reports from Man. and Sask. that *Polyporus tomentosus* and *A. mellea* are associated with root rots in white and black spruce. Root and butt rot of white spruce caused by *Flammula alnicola* was found once in each province. *Melanconium* sp. on aspen, associated with a leaf blight, constituted a new record. A rust on *Melampyrum lineare* was observed which may be the alternate stage to globose rust [? *Cronartium quercuum*] on jack pine [*Pinus banksiana*].

In B.C. A. C. Molnar (pp. 105–110) reports several new infection foci of *Poria weirii* on Douglas fir [*Pseudotsuga menziesii*: cf. **36**, 222], suggesting that this damage is more common than had been supposed. Needle blight (*Rhabdocline pseudotsugae*) [**38**, 718] was observed for the first time on Douglas firs over 80 yr. old. The occurrence of *Taphrina populina* on the hybrid poplars 'grandis' and 'regenerata' may constitute a new world host record.

Henderson (F. Y.). **Report of the Director of Forest Products Research for the year 1959.**—*Rep. For. Prod. Res. Bd, Lond., 1959*, vi+62 pp., 12 pl., 10 graphs, 1960. 5*s*. 6*d*.

In the mycology sect. (pp. 29–33) [cf. **38**, 716] it is stated that a white *Polyporus* sp. was cultured from a brown rot of *Cupressus macrocarpa* from Kenya. *Fomes annosus* was no longer viable in naturally infected timber of Scots pine and European larch which had been stored dry for 10 months.

At low concs. of As, no stimulation of decay by the As-tolerant *Lenzites trabea* could be detected.

Fungi isolated from decayed water cooling tower timbers include *L. saepiaria* and *Poria* sp., causing a brown rot, the latter being the first extensive brown rot decay reported in Great Britain from such a source. Max. decay of beech and pine blocks by *Gloeocystidium lactescens* occurred at an initial moisture content of 60%.

Timber of African mahogany (*Khaya grandifolia*) shows greater resistance to fungal attack than *K. anthotheca* or *K. ivorensis*. A polyphenol has been isolated from the heartwood of Indian rosewood [*Dalbergia latifolia*] which is toxic to wood-destroying fungi, 0·03% being sufficient to prevent growth.

In soft rot investigations Scots pine sapwood blocks buried in unsterilized soil+nutrient solution lost 20% in wt. in 3 months and those in similar sterilized soil inoculated with *Chaetomium globosum* only 2%. A str. of *Sporocybe*, dominant on

the severely decayed blocks, caused 12% loss of wt. in beech blocks in 6 weeks, but little or none in Scots pine. *Humicola grisea* was able to cause soft rot of beech, but not of Scots pine sapwood.

In E. Scotland *Ceratocystis pilifera* and *C. coerulescens* were the main causes of sap stain in Scots pine timber in the wet 1958 summer. Treating the ends of logs with 5% pentachlorophenol emulsions or 4% Na pentachlorophenate gave good protection during 3 months' storage. *Leptographium lundbergii* was found to cause intense stain in association with beetle (*Myelophilus piniperda*) attack. Less intense stains yielded in culture fungi known on pine shoots (e.g. *Diplodia pinea*, *Sclerophoma pithyophylla*, *Macrophoma strobi*, *Graphium* [*C.*] *piceae*, and *Phoma* spp.). Except for *C. piceae*, fungi associated with staining of sawn timber were absent; the spp. staining logs and sawn timber are apparently different.

FINDLAY (W. P. K.). **Heart rots of trees—recognition and significance.** —*Quart. J. For.*, **54**, 2, pp. 146–150, 1960.

In this paper, based on one to Sect. K of the British Ass. for the Advancement of Science, 1959, heart rots are classified as top rots and butt rots, methods of detection outlined, the rate of spread is discussed, and possible means of reducing the incidence of butt rots are described. It is pointed out that many practices in modern forest management can cause injuries that may initiate heart rots.

JANČAŘÍK (V.). **Padání semenáčků v lesních školkách a obrana proti němu.** [Damping-off of seedlings in forest nurseries and its control.]—*Práce výzk. Úst. lesn. ČSR* [*Stud. For. Res. Inst. C.S.R.*], *1960*, 18, pp. 181–257, 11 fig., 2 graphs, 5 maps, 1960. [Russ., Engl. summ. (2 pp.); 68 ref.]

In this survey in 1954–57, based on the data from 94 localities in W. Czechoslovakia, the causes of damping-off, including meteorological and pedological factors, mechanical damage of seedlings, animal activity, and fungus infection, are discussed, the last being given most attention. Observations were made on seedlings of Scots pine [*Pinus sylvestris*], Douglas fir [*Pseudotsuga menziesii*], basswood [*Tilia americana*], spruce, larch, silver fir [*Abies alba*], beech, maple [*Acer* sp.], and hornbeam. The effect of the disease, uncontrolled and controlled, on growth, length of roots, and thickness of the root collar in pine and Douglas fir was studied and the results are tabulated. Among 30 identified genera *Fusarium* was the most common. Successful control [cf. **36**, 216, 625] was obtained from 1% $KMnO_4$ at 3–5 l./sq. m. (according to the penetrability of the soil) applied to a carefully loosened soil. Seed treatment with agronal (active substance phenyl-mercuric bromide) at 1% seed wt. was effective for pine, but not for Douglas fir. Formalin solution (60 ml./6–12 l./sq. m.) applied to the soil 10–14 days before sowing and a subsequent covering of the soil with waterproof material to prevent rapid evaporation ensured higher viability.

RUNOV (E. V.) & MISHUSTINA (Mme I. E.). Влияние лесных насаждений разного состава на микробиологические процессы в выщелоченом черноземе. [Influence of different kinds of forest plantations on microbiological processes in leached black soil.] Труд. Лаб. Лесовед. [*Trud. Lab. Lesoved.*], **1**, pp. 86–126, 5 graphs, 1960. [27 ref.]

Counts by Forestry Lab., Acad. Sci. U.S.S.R., Moscow, of micro-organisms in forest litter showed, *inter alia*, that the microflora is scantier under conifers than under deciduous trees, particularly birch; that bacteria, actinomycetes, and fungi are in general more abundant under older and mycobacteria under younger trees; that in case of conifers numbers are dependent on the depth of the litter; and that yeasts are most numerous in July, actinomycetes and *Mucor* spp. in Oct., and other micro-organisms in Sept. Bacteria are favoured by broad-leaved

trees and larch, and actinomycetes and higher fungi by other conifers. A relationship was established between fermentative activity of litter and soil and their microflora, and between this microflora and that of the rhizosphere.

KESSLER (K. J.) & ANDERSEN (R. L.). **Ceratocystis coerulescens on Sugar Maple in the Lake States.**—*Plant Dis. Reptr*, **44**, 5, pp. 438–350, 4 fig., 1960.

A note from U.S. Dept Agric. of this fungus on sugar maple (*Acer saccharum* [**39**, 195]) in the Upper Peninsula exp. Forest, Dukes, Mich.

ZYCHA (H.). **Stand unserer Kenntnis vom Rindensterben der Buche.** [Present knowledge concerning bark necrosis of Beech.]—*Allg. Forstz.*, **14**, 45, pp. 785–786, 788–789, 5 fig., 1959.

From the Inst. für Forstpflanzenkrankheiten, Hann. Münden, is reported a recent increase in the incidence of this condition [cf. **31**, 534] of uncertain cause. Affected trees should be felled with the least delay to save loss of valuable timber from white rot [loc. cit.].

KRSTIĆ (M.) & HOČEVAR (S.). **Uticaj nekih antagonističkih mikroorganizama na infekcije Pitomog Kestena od Endothia parasitica Anders.** [Effect of some antagonistic micro-organisms on *E. parasitica* infection of Sweet Chestnut.]—*Zasht. Bilja* (*Plant Prot., Beograd*), *1959*, 54, pp. 41–52, 3 fig., 1959. [Engl. summ.]

In experiments by Fac. Forestry, Beograd, and Inst. Forestry, Ljubljana, Yugoslavia, on the control of *E. parasitica* [**39**, 268] by inoculations with *Penicillium rubrum*, *P. lilacinum*, *Verticillium* sp., or *Bacillus subtilis* [cf. **34**, 686], the first-named was most effective. Simultaneous inoculation with the pathogen and the antagonist into incisions in the bark, subsequently sealed to exclude natural infection, revealed no inhibitory effect. Incisions above stump level inoculated with the antagonist only, and unsealed, established natural infection in only 5 of 704 cases, as compared with 25 of 704 in the control (uninoculated incisions). It is suggested that this low rate of infection in the control might be due to natural immunization by the antagonistic flora and that an artificial introduction of the latter might therefore be of use especially in chestnut stands not yet attacked by *E. parasitica*.

PROTSENKO (A. E.). Гриб **Endothia fluens (Sow.) Shear et Stev.,** поражающий **Castanea sativa Mill.** на Кавказе. [The fungus *E. fluens* attacking *C. sativa* in the Caucasus.]—*Bot. Zh. S.S.S.R.*, **45**, 6, pp. 832–843, 2 fig., 1960. [Engl. summ.]

On the strength of morphological and cultural criteria, which are discussed, it was found that the *E.* sp. involved was not the dangerous *E. parasitica* [cf. **38**, 426], but *E. fluens* [cf. **32**, 523], capable of parasitism only in conjunction with other agents causing drying. Attempts to infect healthy chestnut trees with the latter sp. were unsuccessful.

GLITS (M.). **A Monilia bazai előfordulása a Mogyorón.** [The occurrence of *Monilia* on Hazel nut in Hungary.]—*Kertész. Szől.*, 7, 10, p. 21, 1958. [Abs. in *Referat. Zh. Biol.*, *1960*, 11, p. 199, 1960.]

It was established that premature dropping of hazel nuts [*Corylus avellana*] was caused by *Sclerotinia fructigena* [cf. **36**, 38], infection being 71–91% according to var. As a preventive measure hazel should not be planted with apple or pear.

STRONG (F. C.). **Control of Hawthorn leaf blight.**—*Plant Dis. Reptr*, **44**, 6, pp. 396–398, 4 fig., 1960.

In field studies at Mich. agric. Exp. Sta., East Lansing, control of *Entomosporium*

*thuemenii* on *Crataegus oxyacantha* [**35**, 796] was achieved by 3 applications of 5 p.p.m. actidione at 14-day intervals, which gave 90–95% foliage retention compared with only 2–8% in the untreated controls.

HIGGINS (D. J.). **The utilization of glucose carbon by five isolates of the fungus Ceratocystis ulmi.**—*Diss. Abstr.*, **20**, 9, p. 3485, 1960.

In physiological studies at Ohio Sta. Univ. an atypically pathogenic str. of *C. ulmi* which attacked the resistant *Ulmus carpinifolia* [**39**, 506] differed outstandingly from other isolates in total acidity and in the percentage of C in the non-volatile acid fraction. It is thought that the possible presence of a toxin in this fraction might be responsible for the difference in pathogenicity.

OUELLETTE (G. B.) & GAGNON (C.). **Formation of microendospores in Ceratocystis ulmi (Buism.) C. Moreau.**—*Canad. J. Bot.*, **38**, 2, pp. 235–241, 2 pl. (24 fig.), 4 fig., 1960.

At the For. Biol. Div., Res. Branch, Dept Agric., Ottawa, minute cytoplasmic particles behaving like spores (microendospores) [cf. **2**, 93] were observed in the spores and hyphae of several isolates of *C. ulmi* [**38**, 229]. The different stages of development of the microendospores are described.

SMITH (A. N.). **Boron deficiency in Grevillea robusta.**—*Nature, Lond.*, **186**, 4729, p. 987, 1960.

In Dec. 1959 2–3-yr.-old *G. robusta* trees in 1 field of a tea plantation in the Nandi Hills, Kenya, were dying. The most seriously affected were completely defoliated, and all showed bark cracking and exudation of gum, as previously described for B deficiency in wattle [**37**, 319]. An investigation of the water-soluble B in the soil indicated B deficiency, which, however, did not appear to affect the tea bushes.

BRANDT (W. H.). **The effect of the Oak wilt fungus upon Oak wood.**—*Diss. Abstr.*, **20**, 7, p. 2510, 1960.

This study at Ohio State Univ. indicated that there were no direct or indirect effects of *Endoconidiophora* [*Ceratocystis*] *fagacearum* [cf. **38**, 718; **39**, 55] on oak wood, i.e. on the rate of decay in trees infected by it or on other organisms causing decay.

BOYCE (J. S.) & SPEERS (C. F.). **Oak dieback in Virginia in 1959.**—*Plant Dis. Reptr*, **44**, 5, p. 351, 1960.

This was found by S.E. For. Exp. Sta., U.S. Dept Agric., to be associated with the occurrence of *Dothiorella quercina* [cf. **21**, 272] on chestnut oak and white oak, sometimes apparently following attack by the pit-making oak scale *Asterolecanium* sp. (probably *A. variolosum*).

BATRA (L. R.) & STALEY (J. M.). **Occurrence of the sclerotial state of Ciborinia candolleana (Lév.) Whet. in the United States of America.**—*Plant Dis. Reptr*, **44**, 6, pp. 430–431, 2 fig., 1960.

During the summer, 1959, *C.* [*Sclerotinia*] *candolleana* was isolated in its sclerotial form [cf. **6**, 701; **38**, 676] from the veins of red oak (*Quercus rubra*) in the Tiadaghton State Forest, Pa.

GEORGESCU (C. C.), ORENSCHI (S.), & PETRESCU (M.). **Cercetări asupra unei verticilioze la Quercus cerris L.** [Investigations of a verticilliosis of *Q. cerris.*]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 247–257, 3 fig., 1959. [Russ., Fr. summ.]

The occurrence of *Verticillium alboatrum* on Turkish oak in the Brăila district

through introduction of the tree to less favourable conditions of the steppe is reported from Forestry Res. Inst., Bucharest. The reproductive bodies of the fungus and its reactions to modifications of the culture media used are described.

YEH (C.-T.) & KATSURA (K.). **On a new Pestalotia disease of the leaf of Quercus glauca Thunberg and its causal fungus.**—*Sci. Rep. Kyoto Univ. Agric.* (formerly *Sci. Rep. Fac. Agric. Saikyo Univ.*) 11, pp. 52–58, 2 pl. (13 fig.), 1959. [Jap. Abs. from Engl. summ.]

An account is given of ring spot blight of *Q. glauca* caused by *P. kasagiensis* Yeh & Katsura, which is described. Diseased leaves were collected in 4 areas from Nov. 1956 to Nov. 1958, and the causal fungus was isolated on potato agar pH 4·8–6·0. Positive results were obtained with wound inoculations on *Q. glauca*, *Q. dentata*, *Castanea pubinervis*, *Cryptomeria japonica*, tea, and *Eriobotrya japonica*. The brown conidia are usually 2-celled, rarely 3, 12·4–15·5×5·3–6·2$\mu$.

BOKOR (R.). **Vizsgálatok a Tölgyek valódi mykorrhizagombáinak meghatározása és az ezekkel való társulásuknak mesterséges létrehozása terén.** [Studies on the determination of true Oak mycorrhiza and its formation by artificial means.]—*Erdészettud. Közl., 1958*, 1, pp. 93–118, 1958. [Russ., Engl., Germ. summ. Abs. in *Referat. Zh. Biol., 1960*, 11, p. 112, 1960.]

A method is recommended for mycorrhization with cultures from basidiospores of mycorrhiza-forming fungi. At the exp. Sta., Sci. Res. Inst. for Forestry, Sophron, Hungary, 15 of 23 basidiomycete spp. formed true mycorrhiza with oak seedlings, including *Boletus edulis*, *B. subtomentosus*, *B. scaber*, *B. luridus*, *Russula drimeia*, *R. cyanoxantha*, *R. lutea*, and *R. lepida*.

BENBEN (K.). **Co trzeba wiedzieć o chorobach Topól?** [What is it necessary to know of the diseases of Poplar?]—*Las polski*, **33**, 9, pp. 11–14, 1959. [Abs. in *Referat. Zh. Biol., 1960*, 8, pp. 185–186, 1960.]

Twelve fungi and 1 bacterium (*Micrococcus populi*) are mentioned as pathogens of poplar trees and seedlings. Their incidence is studied in relation to various host spp. and control is indicated.

BUTIN (H.). **Über die Sporenkeimung von Dothichiza populea Sacc. et Br. in wäßrigen Rindenextrakten verschiedener Pappelsorten.** [On the spore germination of *D. populea* in aqueous bark extracts of various Poplar species.]—*Ber. dtsch. bot. Ges.*, **73**, 5, pp. 185–197, 1 fig., 2 graphs, 1960. [Engl. summ.]

In further studies [cf. **36**, 673] at the Inst. für Forstpflanzenkrankheiten, Hann. Münden, Germany, after heating the bark of *Populus trichocarpa* [**39**, 354], *P.*× *euramericana* cv. *marilandica*, and cv. *robusta* to 90° C. before maceration, spore germination of *D. populea* was uniform in the extracts of all. When extracts of untreated bark were exposed to air for a short time, germination was completely inhibited in that from *P. trichocarpa*, and strongly inhibited in that from *P. marilandica*, while remaining unaffected in that from *P. robusta*. With dilution the inhibitory effect of the extract from *P. trichocarpa* decreased and finally reversed into an enhancing effect. The addition of nutrients did not affect this extract, and had only a slight influence on those from *P. robusta* and *P. marilandica*. The inhibitory effect decreases with the age of the tissue: it is strong in leaves and buds, low in green shoots, and absent from bark older than 1 yr. The inhibitory factor of *P. trichocarpa* and *P. marilandica* is effective only from early autumn (before leaf fall) until early spring (before the appearance of leaves). A parallel is observed between the ease of germination and host susceptibility, and also between the inhibition of germination and resistance.

Boyer (M. G.). **Observation on foliage diseases of introduced Poplars.**—*Bi-m. Progr. Rep. Div. For. Biol., Dep. Agric. Can.*, **16**, 2, pp. 1–2, 1 graph, 1960.

A study was made of a plantation of introduced poplars near the Que. Lab. during summer, 1959, to ascertain (*a*) whether leaf diseases could reduce green foliage by 25% during the active growing season, (*b*) the relationship between development of diseases and the physiological state of the leaves, and (*c*) if inoculation tests provide reliable criteria for selection of resistant clones. The diseases observed were caused by *Marssonina populi*, *Melampsora medusae*, *Napicladium tremulae*, and unknown. A graph summarizes the data obtained with aspen and 8 hybrid poplars. The unknown disease caused a significant reduction in leaf area in *P. tremula* × *P. tremuloides*, and *Marssonina populi* in *P. deltoides* × *P.* 'Nolga'. The results underlined the necessity for using field observations in conjunction with inoculation tests for the selection of resistant hybrids.

Georgescu (C.) & Clonaru (A.). **Apariția cancerului bacterial al Popului în R.P.R.** [The occurrence of bacterial canker on Poplar in the Romanian People's Republic.]—*Rev. Pădurilor*, **74**, 3, pp. 169-171, 1959. [Abs. in *Referat. Zh. Biol., 1960*, 5, p. 190, 1960.]

The occurrence of bacterial canker on hybrid black poplar is reported from Romania. As causal agents the author mentions *Pseudomonas syringae* f. *populae*, *P.* [*Agrobacterium*] *tumefaciens*, as well as *Dothichiza populea* and *Fusarium* sp. Recommendations are made for control.

Andrews (S. R.) & Eslyn (W. E.). **Sooty-bark canker of Aspen in New Mexico.**—*Plant Dis. Reptr*, **44**, 5, p. 373, 1960.

The 1st record, from Colo. State Univ., Fort Collins, of *Cenangium singulare* [cf. **35**, 560] on aspen (*Populus tremuloides*) in N. Mex.

Basham (J. T.). **Studies in forest pathology XXI. The effects of decay on the production of Trembling Aspen pulpwood in the Upper Pic region of Ontario.**—*Publ. Dep. Agric. Can. For. Biol. Div.* 1060, 25 pp., 27 fig., 9 graphs, 1 map, 1960.

This information from the For. Biol. Lab., Southern Res. Sta., Maple, Ont., has already been covered in its mycological and pathological aspects [**37**, 743].

Karaca (I.). **Gnomonia leptostyla (Fr.) Ces. et de Not. mantarlarının biyolojisi üzerinde bir etüd.** [A study on the biology of the fungus *G. leptostyla*.]—*Bitki Koruma. Bül.*, **1**, 3, pp. 3–9, 2 fig., 1 graph, 1960. [Germ. summ.]

This paper from the Fac. Agric., Ankara Univ., reports the occurrence of *G. leptostyla* on walnut [cf. **39**, 197] in Turkey, where it causes serious damage in regions of high humidity, assuming epidemic proportions in the Çoruh province when the rainfall in Apr. is 20-440 mm. (as in 1955 and 1957-8), but less when it is below 40 mm. (1956). In dry steppe areas little damage results, and the fungus is seen in the Ankara region only when rainfall in Apr. or May is over 40 mm. Perithecia first ripened in Çoruh on 15 Apr., and in Ankara on 7 Apr., all being ripe in both regions by 11 May. The incubation period was approx. 1 month. Ascospore dispersal in Apr. and primary infection, therefore, are more important than summer infection.

Stojanović (D.) & Kostić (B.). **Prilog proučavanju biologije Gnomonia leptostyle (Fr.) Ces. et de Not.** [Contribution to the study of the biology of *G. leptostyla*.]—*Zasht. Bilja* (*Plant Prot., Beograd,*) *1959*, 55, pp. 97–99, 1 graph, 1959. [Engl. summ.]

In 1956 it was observed at the Inst. agric. Res., Kragujevac, Yugoslavia, that the

ejection of ascospores of *G. leptostyla* from walnut leaves [cf. **36**, 6], which in the lab. took place on 21 Jan., started in the field within 1 hr. of the beginning of rain, usually reaching its max. in 4–6 hr., and terminated after 20–22 hr. The ascospores began to develop suddenly in the latter part of Mar. and were mature towards mid-Apr. Their ejection lasted from 25 Apr. to 23 June and was greatest between 29 Apr. and 5 May and between 11 and 16 May.

Miller (P. W.). **The Howe, a possible blight resistant Persian Walnut variety. Recent investigations on the control of Walnut blight by antibiotics and other spray dust materials.**—*Proc. Nut Grs' Soc. Ore. & Wash.* 45 (*1959*), pp. 7–9, 1 fig.; pp. 21–25, 1960.

During 1959 Howe walnut trees showed 0–1·6% infection by *Xanthomonas juglandis* [**38**, 720] while adjacent trees of var. Franquette showed 35·7–66%. Information on the control of *X. juglandis* has already been noticed [loc. cit.].

Purnell (Helen M.). **Cypress canker.**—*J. Agric. Vict.*, **58**, 5, pp. 287–288, 2 fig., 1960.

Canker caused by *Monochaetia unicornis* [cf. **36**, 675; **37**, 116] is now widespread in Victoria, where the spp. most commonly affected are *Cupressus macrocarpa* and *C. lambertiana* and its var. *aurea*.

The Forests Commission, Victoria, recommends that in view of the severity and rapid spread of the disease in the State, *C. macrocarpa* should no longer be used for shelter belt planting. The propagation and distribution of this sp. and its vars. are to be discontinued.

Kailidis (D. S.). **Some aspects of the damping off of Black Pine, Pinus nigra Arn.** —*Diss. Abstr.*, **20**, 8, pp. 3013–3014, 1960.

At Mich. State Univ. the principal pathogenic fungi isolated from black pine nursery soil were *Pythium irregulare*, *P. ultimum*, *P. debaryanum*, *Rhizoctonia* [*Corticium*] *solani*, *Fusarium solani*, *F. oxysporum*, *F. moniliforme* [*Gibberella fujikuroi*: cf. **38**, 547], and *Botrytis cinerea*. *Pythium perniciosum* was also isolated, but was not pathogenic.

*Pythium* grew best at pH 5·5, and 20–30° C. Four strs. of *C. solani* differed in pathogenicity and in cultural appearance. Growth was fastest at pH 4·5–6·5, and at 20–30° C., but was still satisfactory at pH 8.

Several of the principal pathogens, particularly *F. solani* str. 3, exhibited antibiotic activity in mixed culture. *Pythium* was more prevalent during winter in a closed, humid, and well-heated greenhouse, while *Fusarium* spp. were less prevalent and *C. solani* least so. At other seasons *Fusarium* spp. were more prevalent, *C. solani* less prevalent, and *Pythium* spp. least so. Several times *Pythium* spp. were not isolated at all during warm dry periods. Thus, over a range of conditions *Fusarium* spp. were dominant and they were the main cause of damping-off in Michigan.

Under opt. conditions for germination black pine seedlings were more likely to escape damping-off, and at 25–27 days after germination developed resistance. When seedlings growing under favourable conditions in the field did develop root rot the principal pathogens were *Fusarium* spp. All 3 *Fusarium* spp. causing damping-off were also agents of root rot.

Hodges (C. S.). **Studies of black root rot of Pine seedlings.**—*Diss. Abstr.*, **20**, 7, pp. 2467–2468, 1960.

A survey showed that the disease is present on slash [*Pinus elliottii*] and loblolly pine [*P. taeda*] in 3 nurseries in Ga and 1 each in Ala, Fla, N. Carol., and Texas. Work at Univ. Ga showed that necrosis of the lateral and tap roots is accompanied

by roughened areas on the tap root and larger laterals, the development of these areas being due to multiplication and enlargement of the parenchyma cells and abnormal division of the phellogen.

*Sclerotium bataticola* [*Macrophomina phaseoli*] and *Fusarium* spp. were the only fungi consistently isolated. *M. phaseoli*, *F. oxysporum*, and *F. solani*, alone and in combination, were pathogenic, but only *M. phaseoli*, alone or in combination with the other 2 produced symptoms similar to but less severe than those seen in nature. In *M. phaseoli* + *F. oxysporum*-inoculated seedlings the disease was most severe at soil temps. of 25·4–27·8° C. Decrease in weight of seedlings grown in naturally infested soil with increasing temp. confirmed field observations that the disease is most active in summer. The suggestion is made that indoleacetic acid, reported to be produced by the fungi, may cause the proliferation of root tissues in affected seedlings. Soil fumigation with methyl bromide gave the best control. After this treatment *Trichoderma viride* was the dominant fungus among those recolonizing the soil, and often the only one isolated. Several spp. of *Aspergillus* and *Penicillium* made up the majority of the fungi recolonizing vapam-treated soil. *A. fumigatus*, *P. janczewskii* and *T. viride* were present in almost equal numbers after steam treatment.

Orłoś (H.) & Dominik (T.). **Z biologii huby korzeniowej — Fomes annosus (Fr.) Cooke.** [On the biology of the root fungus *F. annosus*.]—*Sylwan*, 104, 1, 13 pp., 5 fig., 1960. [Russ., Engl. summ.]

It is noted that *F. annosus* threatens 15,000–20,000 ha. in Poland, being most severe in 30–40-yr.-old pine stands established on worn-out soils, where it replaces the beneficial mycorrhiza of *Boletus edulis*, found in good forest soil, and as the unfavourable conditions prevailing for mycorrhiza-forming fungi are [illegible] by this and other fungi. Max. damage occurs in summer when long dry periods.

Rather than chemical or mechanical control methods the authors recommend the establishment of other tree types (birch, aspen, willow, or poplar) on degraded agricultural soil for 30–40 yr., followed by spruce or pine with simultaneous addition of soil from good forest land as inoculum.

[illegible] (P. W.). **Fomes annosus root rot of Loblolly Pine.**—*Plant Dis. Reptr*, 44, 6, p. 423, 1960.

The 1st record of damage by *F. annosus* to *Pinus taeda* in the Homochitto National Forest, Miss.

Molnar (A. C.) & McMinn (R. G.). **The origin of basal scars in British Columbia interior White Pine type.**—*For. Chron.*, 36, 1, pp. 50–60, 13 fig., 1960.

It is noted from the Forest Biol. Lab., Victoria, B.C., that the most common causes of basal lesions in western white pine (*Pinus monticola*) in the interior of B.C. are mechanical wounding and injury by bears, fire, infection by *Armillaria mellea*, and pole blight disease [39, 461]. Trees with *A. mellea* infections show a large volume of decay since these scars are in contact with the soil; frequently damage to the root systems renders the trees more liable to windthrow. Most of the scars due to pole blight are narrow and heal rapidly and their importance as entrance courts for decay fungi is not known.

Schütt (E.). **Befallsunterschiede und Resistenz bei Pinus strobus gegen Cronartium ribicola Dietr. = Peridermium strobi Kleb.** [Differences in infection and resistance of *P. strobus* to *C. ribicola*.]—*Züchter*, 30, 2, pp. 61–72, 8 fig., 2 plans, 1960. [103 ref.]

This paper from the Inst. für Forstwissenschaften, Eberswalde, Germany, indicates

a report on *C. ribicola* [**38**, 551] infection in a trial stand of white pine from 10 German and 26 American sources, planted in 1941. The trees were for the most part progenies of single lines. In general, within material of a given origin there was a variation in infection: thus progeny from Harvard Forest, Mass., gave some lines with nil and 1 with 23·08% infection; 3 lines from the headwaters area of the river Emory, Tenn., were free from infection.

Although spores were present on *Ribes* spp. [**37**, 686] in an adjoining field the expected conc. of infection along the edge of the pine stand did not occur. Instead there were foci of infection, indicating the possibility of direct transmission by aecidiospores from 1 pine to another.

In the greenhouse when aecidiospores were introduced into cuts in new bark and 1-yr. bark on 40 4-yr.-old seedlings, 16 produced spermogonia 1 yr. after infection, 7 developing spermogonia in both wounds. In all 37 produced scab typical of blister rust.

In a field resistance test with graftings from 27 old trees, and 800 4-yr.-old seedlings, only 1 grafting and 1 seedling remained uninfected.

Infection was greater in the lower part of a slope, where there was less movement of the air and heavier mist, than in the upper part.

Pešek (F.). **Několik poznámek k výskytu rzi Vejmutovkové.** [Some remarks on the occurrence of rust on Weymouth Pine.] *Lesn. Práce*, **38**, 1, pp. 19–20, 1959. [Abs. in *Referat. Zh. Biol.*, ***1960***, 7, p. 186, 1960.]

*Cronartium ribicola* [cf. **36**, 146] was widespread on *Pinus strobus* in Czechoslovakia in 1952–58. The branches on infected trees above the site of infection dry up and young trees die. The uredo- and teleuto-stages develop in thickets of *Ribes nigrum*, *R. rubrum*, *R. grossularia*, and *R. vulgare*. The fungus also infects *P. monticola*, *P. lambertiana*, and *P. cembra*. Damage to cedar was noted only at a place in the high mountains in 1952.

Cafley (J. D.). **Acti-dione treatment of blister rust on plantation-grown Eastern White Pine.**—*Bi-m. Progr. Rep. Div. For. Biol., Dep. Agric. Can.*, **16**, 3, pp. 2–3, 1960.

Applications of actidione in No. 1 fuel oil against *Cronartium ribicola* [**37**, 686] on *Pinus strobus* during 1959 appeared to stimulate canker development at 50, 100, 150, and 200 p.p.m. but not at 300 p.p.m.

Matthews (F. R.) & McLintock (T. F.). **Effects of fungicides on pollen germination of Slash and Longleaf Pine.**—*Res. Notes Stheast. For. Exp. Sta.* 122, 2 pp., 1958. [Received May, 1960.]

Puratized agricultural spray, captan 50-W, and basi-cop inhibited pollen germination in slash and longleaf pines (*Pinus elliottii* and *P. palustris*) but ferbam sprays (2 or 0·2 lb./100 gal.) increased germination. The efficacy of ferbam as a fungicide for *Cronartium strobilinum* is under investigation [see below].

Matthews (F. R.) & Maloy (O. C.). **What to do about cone rust.**—*For. Farmer*, **19**, 4, pp. 8, 14–15, 1 fig., 1 map, 1960.

Cone rust (*Cronartium* [*strobilinum*: **39**, 58]) on slash and longleaf pines [*Pinus elliottii* and *P. palustris*] in Ga and Fla was controlled effectively by spraying with ferbam, preferably in warm, wet weather. In 1 trial the percentage of rusted cones was reduced from 17 to 3, and in another from 62 to 5.

Hopkins (J. C.). **The locus of entry of the canker fungus Atropellis piniphila into Lodgepole Pine stems.**—*Bi-m. Progr. Rep. Div. For. Biol., Dep. Agric. Can.*, **16**, 2, p. 3, 1960.

During the summer, 1959, at Kananaskis, Alta., 53 young stem cankers on lodge-

pole pine [*Pinus contorta* var. *latifolia*], caused by *A. piniphila* [38, 344], were examined to determine the loci of entry. It was concluded that infections occur most frequently in the nodal regions of stems, and the possibility of entry through undamaged bark is not excluded.

Linzon (S. N.). **The development of foliar symptoms and the possible cause and origin of White Pine needle blight.**—*Canad. J. Bot.*, 38, 2, pp. 153–161, 1 pl. (4 fig.), 1 graph, 1960. [24 ref.]

During 1957–8 seedlings and saplings of eastern white pine (*Pinus strobus*) at Chalk River, Ont., were examined for needle blight [cf. 35, 156]. The 1st symptoms are faint pinkish spots on the stomata-bearing faces of 4-week-old needles which rapidly turn to orange-red bands spreading to the needle tips. Mature tissues are not susceptible and in subsequent attacks lesions developed proximally on tissues derived from basal meristem. Early summer attacks killed only the limited areas at the tips of needles, but attacks when the needles were nearly full-grown involved their whole length. A few major outbreaks of blight occurred during 1 season, and the trees developed symptoms at essentially the same time following 1 or more days of wet weather and a continuous sunny period. No micro-organisms were isolated from tissues showing the initial stages of the condition. It is suggested that susceptibility to blight is inherent in individual trees, which respond accordingly, rather than due to varying local predisposition among uniformly susceptible individuals.

Bakshi (B. K.) & Singh (S.). **A new genus in plant rusts.**—*Canad. J. Bot.*, 38, 2, pp. 259–262, 1 pl. (3 fig.), 2 fig., 1960.

At the For. Path. Branch, For. Res. Inst., Dehra Dun, India, the life history of *Chrysomyxa piceae*, causing needle rust of spruce (*Picea smithsiana*), was studied. Although its teliospores are 1-celled like *Coleosporium*, and germinate like *Chrysomyxa*, the fungus does not belong to either of these gen. and is named *Ceropsora piceae* (Barclay) Bakshi & Singh, the type of a new genus. It is allied to *Mikronegeria*.

Parker (A. K.) & Johnson (A. L. S.). **Decay associated with logging injury to Spruce and Balsam in the Prince George region of British Columbia.**—*For. Chron.*, 36, 1, pp. 30–45, 10 fig., 6 graphs, 1960.

In this survey by the Forest Biol. Lab., Victoria, B.C., spruce (*Picea glauca* var. *albertiana*) in the 12–16 in. diam. class showed a significantly higher level of infection (chiefly by *Stereum sanguinolentum* [39, 198] (81% of scars), followed by *Peniophora septentrionalis* and *Coniophora puteana*) in 5-yr.-old butt scars than in trees in the 4–6 in. class. In smaller scars (up to 144 sq. in.) the higher up the tree the lower the level of infection: in larger scars position had little effect. The rate of decay in balsam (*Abies lasiocarpa*) scars (*S. chailletii* [38, 631] isolated from 50%, *S. sanguinolentum* from 37%) was less for the first 15 yr. after scarring than in spruce.

Campbell (R. N.) & Clark (J. W.). **Decay resistance of Bald Cypress heartwood.**—*For. Prod. J.*, 10, 5, pp. 250–253, 4 graphs, 1960.

At the Forest Products Lab., Forest Service, U.S. Dept Agric., heartwood test blocks ($1 \times 1 \times \frac{3}{8}$ in.) of *Taxodium distichum* [39, 253] and its var. *nutans* from 7 localities in the principal growing areas, graded into 4 classes according to the natural colour of the wood, were tested by the D 1413–56T soil block technique [38, 168] for resistance to *P*[*oria*] *monticola*, *P. incrassata*, *L*[*enzites*] *trabea*, and *L. striata*, all of which have been isolated from rotting *T. distichum*. Only 1 tree of 27 exhibited the high resistance for which this timber is noted. There was a slight tendency for decay resistance and depth of colour to be more marked in older trees.

HARAGUCHI (T.) & YAMAGUCHI (H.). **The classification of wood-destroying fungi by the index number of wood-decomposing type.**—*J. Jap. For. Soc.*, **40**, 12, pp. 512–514, 1958. [Jap.; Engl. summ. *Biol. Abstr.*, **35**, 8, p. 1952, 1960.]

Numerical classification of the fungi according to the index of decomposition (I.D.) 0–10 (= 10×decomposed lignin ( +cellulose)) is proposed by Kyoiku Univ., Tokyo. It was used for 9 spp. on 4 different kinds of wood meal as culture medium, which gave different indices. The I.D. also changed with the period of decay.

LOHWAG (K.). **Versuche mit Torula monilioides Corda.** [Experiments with *T. monilioides*.] —In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 419–420, 1959. [Roman. summ.]

At the Hochschule für Bodenkultur, Vienna, measurement of wt. reduction in malt-soaked wood-sticks inoculated with *T. monilioides* indicated that this fungus cannot be classed as wood-destroying.

DUNCAN (CATHERINE G.). **Wood-attacking capacities and physiology of soft-rot fungi.**—*Rep. For. Prod. Lab., Madison*, 2173, 28 +42 [unnumbered] pp., 15 fig., 4 graphs, 1960. [32 ref.]

These studies, the results of which are fully tabulated, involved the isolation and identification of over 100 fungi. The determination of soft-rotting capacities and physiological characteristics showed that a large number of wood-inhabiting ascomycetes and fungi imperfecti can cause soft rot. They usually attack wood, except that of high moisture content, more slowly than do basidiomycetes, which have lower temp. optima; the rate is, however, generally higher in hardwoods than in soft. Tolerance of preservatives is very varied, but they are often more tolerant of Na salts and ZnCl than basidiomycetes. Growth of both types of fungi is best near pH 6, but only the soft-rot fungi can grow at pH 8–9.

MEYERS (S. P.) & REYNOLDS (E. S.). **Occurrence of lignicolous fungi in northern Atlantic and Pacific marine localities.**—*Canad. J. Bot.*, **38**, 2, pp. 217–226, 1 graph, 1960. [14 ref.]

Panels of basswood (*Tilia americana*) and yellow pine (*Pinus palustris*) submerged at marine sites at Kodiak, Alaska, Nanaino, B.C., St. Andrews, N.B., Halifax and Liverpool, N.S., and Argentia, Newfoundland, at temps. of 0–15° C. were attacked by many ascomycetes and deuteromycetes, dominants being *Lulworthia*, *Ceriosporopsis* [cf. **39**, 134], *Peritrichospora*, *Halosphaeriopsis*, *Piricauda*, *Humicola*, and representatives of Helicosporae. A more complete evaluation of the mycota at the Marine Lab., Miami Univ., Fla, was obtained after incubation of the panels, which indicated early infestation of the wood. Differences between the dominant mycota of northern and southern environments were apparent, especially among the deuteromycetes: various gen. and spp. prevalent in warmer oceanic areas have not been found in colder.

FINDLAY (W. P. K.). **Bor-Verbindungen für den Holzschutz gegen Pilze und Insekten.** [Boron compounds for timber protection against fungi and insects.] —*Mitt. dtsch. Ges. Holzforsch., 1959*, 46, pp. 43–46, 1 graph, 1959.

A general discussion on B compounds [cf. **39**, 640] for use against fungal staining.

CHUPP (C.) & SHERF (A. F.). **Vegetable diseases and their control.**—v+693 pp., 169 fig., New York, The Ronald Press Co., 1960. $12.00.

This very useful book, like its forerunner [**4**, 560], is intended for growers as well as plant pathologists and other agricultural specialists. The general presentation is as before, but while chapters on potato diseases and fungicides are now omitted,

others cover seed rot, damping-off, and wire stem; general diseases (parasites common to a number of crops); diseases of tropical and minor northern vegetables; minor element deficiencies; and nematodes. Special attention is given to the weather conditions favouring the diseases, and to noting resistant vars. References follow each disease section.

RAMSEY (G. B.), FRIEDMAN (B. A.), & SMITH (M. A.). **Market diseases of Beets, Chicory, Endive, Escarole, Globe Artichokes, Lettuce, Rhubarb, Spinach, and Sweetpotatoes.**—*Agric. Handb. U.S. Dep. Agric.* 155, 42 pp., 19 pl. (7 col.), 1959. [134 ref.]

This useful publication, which supersedes *Misc. Publ.* 541 [**24**, 172], describes and illustrates the common diseases of some vegetable crops, with notes on control, to facilitate inspection and reduce losses.

CONROY (R. J.). **Virus diseases of crucifers.**—*Agric. Gaz. N.S.W.*, **71**, 5, pp. 225–229, 246, 6 fig., 1960.

An account of the symptoms, host ranges, and control of cabbage black ring spot virus [**38**, 636] and cauliflower mosaic virus in N.S.W. [**24**, 403].

KRISTENSEN (H. R.). **Virussygdomme hos korsblomstrede i Danmark.** [Virus diseases among crucifers in Denmark.]—*Nord. JordbrForskn., Suppl.* 1, pp. 292–293, 1960.

A summary of information concerning turnip mosaic [**24**, 438] and turnip yellow mosaic [**37**, 429] viruses.

LAMB (K. P.). **Field trial of eight varieties of Brassica field crops in the Auckland district. I. Susceptibility to aphids and virus diseases.**—*N.Z.J. agric. Res.*, **3**, 2, pp. 320–331, 2 graphs, 1960.

Aphid counts by the D.S.I.R., Auckland, revealed that Broad-leaf Essex rape and Superlative swede are highly susceptible, Wye swede and chou moellier (marrow stem kale) moderately susceptible, Doon Spartan and Calder swedes resistant, and York Globe and Green Globe turnips highly resistant to *Brevicoryne brassicae* [cf. **33**, 130]. In the case of *Myzus persicae* [loc. cit.] the order differed and Wye swede was the most susceptible. Turnip vars., however, showed a high incidence of both turnip mosaic and cauliflower mosaic viruses, which were the chief cause of plant mortality in general. Varietal differences in relation to particular viroses were considerable; Calder and Doon Spartan swedes and chou moellier were highly resistant to turnip mosaic and these, together with Wye swede, were moderately resistant to cauliflower mosaic. The time of infection was correlated with aphid flights and differences in aphid behaviour seem to have been reflected in virus incidence. For winter survival and yield chou moellier and Doon Spartan were the best and Calder and Wye swedes the next best vars.

HEITEFUSS (R.), STAHMANN (M. A.), & WALKER (J. C.). **Production of pectolytic enzymes and fusaric acid by Fusarium oxysporum f. conglutinans in relation to Cabbage yellows. Oxidative enzymes in Cabbage infected by Fusarium oxysporum f. conglutinans.**—*Phytopathology*, **50**, 5, pp. 367–370; 370–375, 1960. [13 and 21 ref.]

At the Depts Biochem. and Plant Path., Univ. Wis., Madison, when *F.o.* f. *conglutinans* [*F. conglutinans*: **39**, 514] and f. [*F. bulbigenum* var.] *lycopersici* [cf. **39**, 738] were cultured on wheat bran and on stem sections of cabbage and tomato sterilized with propylene oxide the latter pathogen produced much more pectin depolymerase and methylesterase, measured by methods used before [cf. **33**, 747],

than the former. Pectate was hydrolysed by *F. conglutinans* on wheat bran to galacturonic acid, but with *F.b.* var. *lycopersici* this took place (to a small extent) only when spores cultured on pectin medium were used as inoculum. The low depolymerase activity of *F. conglutinans* and its action on pectate may in part account for the absence of wilt in cabbage yellows.

Fusaric acid, assayed by Zähner's methods [**34**, 169], was produced by *F. conglutinans* in Richards's medium, but not on cabbage stem sections, nor was it detected in diseased host tissue, and it was rapidly metabolized on introduction into cabbage cuttings. It would appear to be of little or no importance in the production of yellows symptoms.

Respiration and oxidative enzyme activity were studied in cabbage plants resistant (Jersey Queen) and susceptible (Early Jersey Wakefield) to *F. conglutinans* and inoculated with this pathogen. After 8 and 16 days respiration was slightly increased (14–15%) in the inoculated susceptible var., though less than in other comparable host-parasite reactions [cf. **37**, 528, 739]. When oxidation of ascorbic acid was tested with leaf extracts from rooted plants the increase in rate in susceptible plants ranged from 4% 8 days after inoculation to 246% after 16, the corresponding increases over healthy plants being 41 and 113%. Healthy leaves of the 2 vars. showed no difference. As an alternative to inoculation of rooted plants from the greenhouse by root dipping, which did not induce sufficient metabolic change in the leaves, cuttings from 4–5-week-old plants in a growth chamber were inoculated through the base of the cut stem. This induces typical symptoms in the susceptible var. in 7–8 days and only diffuse chlorosis in resistant plants, showing that resistance factors are active in the leaves as well as in the roots and lower stems. Leaf extracts from cuttings of the susceptible var. showed a 35% increase in ascorbic acid oxidation after 4 days as compared with the healthy controls and a 55% increase after 8 days. In similar cuttings of the resistant var. the increase was 86% after 4 days, but slightly less after 8. At 14 days the total ascorbic acid content of susceptible inoculated plants was about half that of healthy plants.

Peroxidase activity in inoculated susceptible plants increased from 18% after 8 days to 94% after 16 days in the greenhouse and from 33 to 136% in the growth chamber. There was no difference between healthy leaves of resistant and susceptible vars. In inoculated cuttings increases at 8 days were 32% in the susceptible and 20% in the resistant. As filtrates from cultures on living stem sections showed large increases in peroxidase and those on bran or autoclaved leaf extracts no increase, peroxidase is considered to be formed by the host rather than the fungus.

Shishelova (Mme N. A.). Взаимоотношения **Erwinia carotovora** с микрофлорой очагов мягкой гнили семенников Капусты. [Interrelations between *E. carotovora* and the microflora of soft rot centres in Cabbage seedlings.]—Труд. всес. н.-и. Инст. сел.-хоз. Микробиол. [*Trud. vses. n.-i. Inst. sel.-khoz. Mikrobiol.*], **15**, pp. 293–300, 1958. [Abs. in *Referat. Zh. Biol.*, *1960*, 8, p. 189, 1960.]

In further studies [**38**, 434] cultures of *E. carotovora* on MPA [? malt peptone agar] were streaked with various bacteria from rot centres on cabbage. *Bac*[*cillus*] *subtilis* and *B. mesentericus* were the most antagonistic. When pieces of potato tissue were inoculated jointly with culture suspensions of *E. carotovora* and each of the test bacteria *B. polymyxa* proved inhibitory and considerably reduced the amount of rot.

Vanterpool (T. C.). **The ring spot disease of Rape in an inland parkland region.**—*Plant Dis. Reptr*, **44**, 5, pp. 362–363, 1960.

*Mycosphaerella brassicicola* [cf. **38**, 552], which had hitherto been known only from coastal and other humid areas [map 189], was noted from Univ. Saskatoon on summer oil rape (*Brassica campestris* var. *annua*) in an inland region (E.-central

Sask.) with annual rainfall 15 in., this being the 1st record on a crucifer in Sask. and on rape in Canada. It was isolated from plant debris after harvest and from diseased seeds, and its European origin via immigrants is suspected.

Endo (R. M.) & Linn (M. B.). **The white-rust disease of Horseradish.**—*Bull. Ill. agric. Exp. Sta.* 655, 56 pp., 21 fig., 9 graphs, 1960.

A detailed study of the factors governing conidial germination in *Albugo candida*, the initiation and development of the disease on horse-radish [**31**, 466], and the methods by which the pathogen overwinters. Control measures suggested include taking setts only from the terminal end of the primary root, removing all infected plants, and destroying foliage mechanically at least 7 days before harvest.

Peterson (J. L.). **Studies on resistance in Radish to Fusarium oxysporum f. conglutinans race 2.**—*Diss. Abstr.*, **20**, 7, pp. 2483–2484, 1960.

At Univ. Wis. it was found that penetration of susceptible and resistant radish vars. by *F. oxysporum* f. *conglutinans* [*F. conglutinans*] race 2 [cf. **37**, 126] occurred through the root tips of both primary and secondary roots and through the epidermal and cortical tissues of the region of differentiation. Penetration elsewhere in the root occurred rarely, and not at all in the hypocotyl. Advance was mainly towards the stele, where there was little difference in the extent of fungal invasion between the resistant Early Scarlet Globe and the susceptible White Icicle. Vascular invasion of both vars. occurred, but was slight in the former. Ultimately, the fungus spread to the cortex, causing deterioration; conidial and chlamydospore formation in the xylem vessels occurred only in White Icicle. No suberized thickenings formed in response to invasion. Passage continued to the upper parts of susceptible plants, including the leaves and apical meristem, which usually resulted in failure to form buds. Resistant vars. were seldom penetrated above the lower hypocotyl. Resistance appears to be confined mainly to the vascular system and is not due to any morphological barrier. Plants infected when young had a briefer survival than those infected at a later stage.

The greatest conc. of inoculum induced the most severe reaction. Stroking the roots to injure them before dipping in a fungal suspension increased the severity of reaction to the heavier concs.

Selfed progenies of the resistant line appeared to be almost 100% resistant. Resistance seems to be polygenic and was introduced into White Icicle, in which it is now being built up.

Duffus (J. E.). **Radish yellows, a disease of Radish, Sugar Beet, and other crops.**—*Phytopathology*, **50**, 5, pp. 389–394, 1 fig., 1960.

This newly discovered virus, studied at U.S. agric. Res. Sta., Salinas, Calif., occurs in the San Joaquin and Salinas Valleys. It induces interveinal yellowing of the leaves (generally lower and intermediate) of sugar beet, spinach, lettuce, radish, and several other crop plants and weeds. Some plants are symptomless carriers. It was not seed-borne in tests with lettuce and *Capsella bursa-pastoris* and was sometimes found in association with the viruses of malva yellows [**39**, 761] and beet yellows, but is distinguished from both by host and vector reactions, although symptoms on sugar beet are similar to those of mild beet yellows virus. In tests with common aphids it was transmitted by *Aphis helichrysi*, *Macrosiphum* [*Metopolophium*] *dirhodum*, *Macrosiphum granarium* [*M. avenae*], *Myzus ornatus*, and *M. persicae* (a notably efficient vector). With *M. persicae* the necessary acquisition feeding period was 5 min., and for transmission 10 min. The incubation period in the vector was 12–24 hr. and the virus was retained for up to 29 days when aphids were transferred daily. The virus appears capable of reducing beet sugar yields by 19%.

ESAU (KATHERINE). **The development of inclusions in Sugar Beets infected with the Beet-yellows virus.**—*Virology*, **11**, 2, pp. 317–328, 25 fig., 1960.

At the Dept Bot., Univ. Calif., Davis, inclusion bodies [cf. **39**, 518] were first recognized in the phloem of seedlings 7 days after inoculation with beet yellows virus. Before this only masses of granular material, which later became fibrous, were present in the phloem cells. At first the fibrils were dispersed, fibrous spindle-shaped bodies developing later. The banded type of inclusion body was detected sometimes before and sometimes after the fibrous. The former showed faint double refraction in living material. The bands consist of rodlet units, as long as the bands are wide. Some inclusion bodies show a structure transitional between that of the banded and fibrous types. The cytoplasmic changes leading to the formation of inclusions are initiated in nucleate cells adjacent to mature sieve elements without nuclei. Later, inclusions also appear in tissues outside the phloem.

NEEB (O.) & GRUPE (H.). **Einfluß von Nährstoffmangel und Vergilbungsinfektion auf die Zuckerveratmung lagernder Zuckerrüben.** [Influence of nutrient deficiency and yellows infection on sugar respiration of stored Sugar Beets.]—*Zucker*, **13**, 14, pp. 348–357, 2 diag., 2 graphs, 1960. [Engl., Fr. summ. 31 ref.]

At the Institut für Zuckerrübenforschung, Göttingen, Germany, losses of sugar through respiration [cf. **38**, 235] increased considerably over a 7-week period of storage at 15° C. In relation to beet surface and fresh wt. the respiratory rise was significant with deficiency of K (147%), B (65), Mg (33), and Mn (24) [cf. **33**, 698; **34**, 271; **37**, 430 *et passim*], whereas yellows virus caused an important increase only at 5°. Considerable increases in O consumption by the leaves occurred only with K and Mn deficiencies and in yellows-infected beets.

ŠUTIĆ (D.), JONČIĆ (M.), & ĐORĐEVIĆ (R.). **Uticaj virusa žutice na prinos i sadržaj šećera Repe.** [Effect of Beet yellows virus on the yield and sugar content of Beet.]—*Zasht. Bilja* (*Plant Prot., Beograd*), *1959*, 55, pp. 15–22, 1959. [Engl. summ. 20 ref.]

At the Fac. Agric., Beograd, and Plant Breeding and Selection Sta. of Sugar Beet Seed, Aleksinac, Yugoslavia, natural infection by beet yellows virus [cf. **39**, 448] was shown to reduce root yield by 28·7%, leaf yield by 21·2%, total dry matter by 0·8% (with an 81·9% increase in noxious N), and sugar by 1·4%/plant and 34·6%/unit area. The loss of leaf is due to reduction in the root rather than to the direct agency of the parasite.

POP (I. V.). **O viroză la Sfecla de Zahăr, nouă pentru Republica Populară Romînă.** [Virus disease of Sugar Beet, new to Romania.]—*Comun. Acad. Repub. rom.*, **9**, 5, pp. 445–452, 1959. [Abs. in *Referat. Zh. Biol.*, *1960*, 11, p. 197, 1960. Russ., Fr. summ.]

This disease, observed in Romania in 1958, is characterized by ring-shaped leaf spots and streaks, distributed along the veins, initially chlorotic, and subsequently becoming necrotic. Sometimes there is pronounced leaf deformation. The virus caused local lesions when inoculated to leaves of *Chenopodium amaranticolor* and *Amaranthus caudatus*.

SCHLÖSSER (L. A.). **Der Verlauf des Cercospora-Befalles in Nord-Italien im Jahre 1959.** [The course of *Cercospora* infection in North Italy in the year 1959.] —*Pflanzenschutz*, **12**, 4, pp. 46–47, 1960.

Conditions in the beet-growing regions of the Romagna and the Po Valley are particularly favourable to *C. beticola* infection [**39**, 519], and the lesions generally first appear in mid June or later. In the exceptionally wet and warm summer of 1959 the foliage was luxuriant and delicate. The first symptoms were delayed but

in late July the progress of the disease was so rapid as to destroy the entire foliage of unsprayed crops in a few days. Losses in sprayed crops were also heavy because treatment had been delayed until symptoms appeared. Usually the final destruction of the foliage in resistant vars. occurs 4–6 weeks later than in susceptible vars., but in 1959 the interval was only 2 weeks; this is in agreement with experience in the greenhouse (Heinrich, unpublished).

SCHÜRNBRAND (E.). **Die Futterrübe als Ansteckungsquelle für das Auftreten der Blattfleckenkrankheit (Cercospora beticola) an Zuckerrüben und die Beseitigung der Gefahr durch Maßnahmen zur Verhütung und Ausschaltung der Zuckerrübeninfektion.** [Fodder Beet as a source of leaf spot infection (*C. beticola*) of Sugar Beet, and the removal of the danger by measures to prevent and eliminate the Sugar Beet infection.]—*Pflanzenschutz*, **12**, 1, pp. 1–2, 1960.

In southern Bavaria most fodder beet stands show moderate to heavy leaf spot [cf. **39**, 266] by the end of July, and are a source of infection for sugar beet, which, being raised from disinfected seed, would otherwise be free from serious disease up to the end of Aug. Existing trade arrangements for the supply of fodder beet seed make it difficult or impossible to arrange for disinfection before sale. The author proposes that the trade be alerted to the danger, and suggests that, while the problem is under consideration, some degree of control may be secured by strict measures to prevent seed infection.

KRENNER (R.). **Welche Entwicklung nimmt die Cercospora-Bekämpfung im österreichischen Zuckerrübenbau?** [The development of *Cercospora* control in the Austrian Sugar Beet industry.]—*Pflanzenarzt*, **13**, 6, pp. 53–54, 1960.

In tests in 1959 by the Bundesanstalt für Pflanzenschutz, Vienna, in collaboration with the Verein für Zuckerrübenforschung [cf. **39**, 360] 3 applications of Cu (vitigran, 3 kg./ha.) on 23 July, 10 Aug., and 3 Sept. were replaced by 2 of brestan (1·4 kg./ha.), on the first and last of these dates, with almost the same degree of effectiveness against *C.* [*beticola*]. Brestan is not, however, recommended in dry areas where true mildew [*Peronospora schachtii*] occurs.

GÖBELEZ (M.). **Türkiye'de Şeker Pancarında Cercospora hastalığı.** [Cercospora on Sugar Beet in Turkey.]—*Şeker*, **8**, 33, pp. 19–27, 4 graphs, 1959. [Fr. summ.]

Sugar beet in the Black Sea Adapazari region is heavily affected by *Cercospora* [*beticola*: **37**, 256], resulting in an annual loss of sugar yield of 4,000–6,000 tons. R.H. in summer in the region is very high. Symptoms begin to appear about June, and the damage is most severe in July–Aug. Treatment with 1% Bordeaux in trials in 1958 gave the best results with Kleinwanzleben E. So far, however, no especially resistant vars. have been found. A 3-yr. rotation and early sowing are advocated.

MATIĆ (I.) & ČAMPRAG (D.). **Utvrdjivanje optimalne koncentracije bordovske čorbe u suzbijanju pegavosti lišća (Cercospora beticola Sacc.) Šećerne Repe.** [Determination of the optimum concentration of Bordeaux mixture for the control of cercosporiosis of Sugar Beet (*C. beticola*).]—*Poljopr. Vojvod.*, **6**, 11, pp. 773–780, 1958. [Abs. in *Referat. Zh. Biol., 1960*, 6, p. 204, 1960.]

In further trials in 1955–6 in the Sugar Refinery's exp. field at Crvenka, Vojvodina, Yugoslavia, sugar beet plants were sprayed 2–3 times with 1, 1·5, or 2% Bordeaux at 2·3, 3·75, or 5 kg./ha. against *C. beticola* [**36**, 227; **39**, 66]; 2% gave the best results.

SEVOST'YANOV (S. P.) & ELETSKAYA (Mme L. E.). О путях повышения продуктивности церкоспороустойчивых форм Сахарной Свеклы. [On ways of

increasing productivity of Sugar Beet forms resistant to cercosporiosis.]—Ex Труд. Конференции «Наследственность и Изменчивость Растении, Животных, и Микроорганизмов», Том II. [Trans. Conference 'Heredity and Variability of Plants, Animals, and Micro-organisms', Vol. II], Moscow, Acad. Sci. U.S.S.R., pp. 508–513, 1 fig., 1959.

At the First of May Sugar Beet Selection exp. Sta. new high yielding sugar beet vars. with increased resistance to *Cercospora beticola* [**39**, 520] have been produced. The 'Pervomaĭskiĭ' hybrid, under State testing since 1955, is an example; for a number of years it has surpassed P 632 and P 06. The best hybrids of Ur × Tsep have been used to produce new types, combining high resistance with good root wt. and sugar content. The first selections gave resistant forms with higher sugar productivity. In 1957 hybridization of resistant forms with a monospermous form was started for the production of new vars., combining resistance to *C. beticola* with monospermy and high sugar content.

Palti (J.). **Nokhaḥ hinnaga'ut ha-Ṣelek be-kishyon rolfs.** [On *Sclerotium rolfsii* infection of Beet.]—*Hassadeh*, **39**, 8, pp. 963–964, 1 fig., 1959. [Heb.]

Recommendations are made for the control of *S. rolfsii* [**34**, 120] on sugar and fodder beet, which are particularly susceptible in Israel. Infection develops only at medium to high temp. (in Israel from the end of Apr./May–Oct./Nov.) and is much more severe on mature than on young plants. Early harvesting is, therefore, advocated and beet should be lifted as soon as 5–10% infection is observed. Ediktol can be used for chemical control of isolated initial foci, but is uneconomical for wider areas. Even susceptible crops, however, can be grown in infested areas after beet provided sowing is not earlier than Sept.–Oct., and harvesting not later than the end of Apr. or beginning of May.

Tuveson (R. W.) & Garber (E. D.). **Genetics of phytopathogenic fungi. I. Virulence of biochemical mutants of Fusarium oxysporum f. pisi. II. The parasexual cycle in Fusarium oxysporum f. pisi.**—*Bot. Gaz.* **121**, 2, pp. 69–74; pp. 74–80, 14 fig., 1959.

At the Dept Bot., Univ. Chicago, Ill., 1 isolate of *F. oxysporum* f. *pisi* race 1 was virulent on root inoculation to 5 vars. of garden pea, another was virulent on only 2 of them [cf. **37**, 127], while 2 isolates of race 2 were also virulent on 2 vars. The 5 vars. displayed a pattern of susceptibility and resistance to biochemical mutants of race 1, and 2 of them displayed a similar pattern to biochemical mutants of race 2. Sections of root and stem from susceptible vars., added to a minimal medium, met the nutritional requirements of all virulent mutants. All mutants failing to grow under these circumstances were avirulent or of questionable virulence, on the vars. from which the sections were made.

The pattern of susceptibility and resistance is explicable in terms of the nutrition-inhibition hypothesis (Garber, *Amer. Nat.*, **90**, pp. 183–194, 1956).

Mutants were reisolated unchanged from 19 of 20 plants into which they had been inoculated.

Diauxotrophic strs. were used to produce heterokaryons [cf. **36**, 45]; they were quite unlike the component strs.; 1–4 diploid spores were found when approx. $1 \times 10^6$ spores from 4 of 5 heterokaryons were plated on a minimal medium.

King (T. H.), Johnson (H. G.), Bissonnette (H.), & Haglund (W. A.). **Development of lines of Pisum sativum resistant to Fusarium root rot and wilt.**—*Proc. Amer. Soc. hort. Sci.*, **75**, pp. 510–516, 1 fig., 1960.

At Minn. agric. Exp. Sta. 150 canning and garden pea vars. were all as susceptible as Perfected Wales to *F. solani* f. *pisi* and *F. oxysporum* f. *pisi* races 1 and 2 [**38**, 345], or more so. Eight of 391 accessions from the plant introductions station at

Ames, Iowa were selected as being more resistant and were used to obtain lines combining resistance with desirable canning seed and plant characters. Some were 50–75% more resistant than Perfected Wales in a year favourable for the disease when other vars. were eliminated.

LOCKWOOD (J. L.) & BALLARD (J. C.). **Evaluation of Pea introductions for resistance to Aphanomyces and Fusarium root rots.** *Quart. Bull. Mich. agric. Exp. Sta.*, **42**, 4, pp. 704–713, 4 fig., 1960.

In greenhouse tests, the results of which are tabulated, only 18 out of 805 pea introductions rated less than 5 on a scale 0–8 in resistance trials with *A. euteiches* [**38**, 722]. In similar trials against *F. solani* f. *pisi* [**38**, 345], using a disease scale 0–9, 69 of 793 accessions rated 1–3.

YERKES (W. D.) & PATIÑO (G.). **The severe Bean mosaic virus, a new Bean virus from Mexico.**—*Phytopathology*, **50**, 5, pp. 334–338, 6 fig., 1960.

The virus and its host reactions are described in detail from the office of the Rockefeller Foundation agric. Program, Mexico. The disease [cf. **36**, 159] has been apparent for 4 yr. in the Gulf Coast region. Symptoms, though resembling those of common bean mosaic virus, are more severe and inoculated plants develop systemic leaf mottle and varying types of necrosis. All vars. of *Phaseolus vulgaris*, *P. lunatus*, soybean, and cowpea tested became infected. Sweet pea, pea, and vetch are symptomless carriers. Tomato, *Cucumis* sp., and *Nicotiana* spp. could not be infected, and the virus is not seed-borne. It withstands heating to 92° C., dilution 1 : 4,000,000, and ageing 7 months in dry tissue, 11 weeks in expressed sap, and 10 weeks in frozen sap, and resists protein-precipitating and oxidizing agents.

YERKES (W. D.). **Interaction of potassium giberellate and a stunting Bean virus on Beans, Phaseolus vulgaris.**—*Phytopathology*, **50**, 7, pp. 525–527, 3 fig., 1 graph, 1960.

Further details from the Rockefeller Foundation, N.Y., of information already noticed [**39**, 362] concerning severe bean mosaic virus [see above].

KORSAKOV (N. I.). Влияние предпосевной обработки семян антибиотиками на поражаемость Фасоли бактериальными и вирусными болезнями. [The effect of pre-sowing treatment of seed with antibiotics on the susceptibility of Bean to bacterial and virus diseases.] Сборн. Работ Аспирант. молод. науч. Сотрудн. всес. Инст. Растениевод. [*Sborn. Rabot Aspirant. molod. nauch. Sotrudn. vses. Inst. Rastenievod.*], *1959*, pp. 97–102, 1959. [Abs. in *Referat. Zh. Biol.*, *1960*, 11, p. 194, 1960.]

Among antibiotics tested for pre-sowing dry treatment of bean [*Phaseolus vulgaris*] seed, 20% streptomycin and 20% preparation N 696 reduced [unspecified] bacteriosis in medium and highly susceptible vars. by 6–9 and 17–23%, and increased yield by 12–15%. Antibiotic solutions used for semi-dry seed treatment increased bacterial brown spot [*Pseudomonas syringae*] in medium and highly susceptible vars., but reduced it in the mildly susceptible var. Triumph to 11–12% (microcide) and 23–26% (preparation 1131), and slightly reduced bean common mosaic [virus] infection in all vars. tested.

YEN (D. E.) & BRIEN (R. M.). **French-Bean rust (Uromyces appendiculatus). Studies on resistance and determination of rust races present in New Zealand.**—*N.Z.J. agric. Res.*, **3**, 2, pp. 358–363, 1960.

Identification tests by the D.S.I.R., Auckland, suggested the presence of the races 10, 17, and 28 of *U. appendiculatus* and possibly another race attacking the differential line U.S. 780. In field and glasshouse crosses between the resistant var. Westralia and susceptible vars. heterozygous plants showed delayed, but definite,

infection, while homozygous plants which were susceptible showed equal susceptibility with susceptible parents. Susceptibility is thus termed recessive or dominant according to when disease symptoms in segregating populations are recorded [cf. **36**, 158].

ZAUMEYER (W. J.). **A new race of Bean rust in Maryland.** —*Plant Dis. Reptr*, **44**, 7, pp. 459–462, 2 fig., 1960.

A new race of *Uromyces phaseoli* [*U. appendiculatus*], designated 32, was isolated from several vars. of bean [*Phaseolus*] in 2 locations in Md in 1959. In inoculation tests only 1 (Tennessee Green Pod) of 56 bush snap bean vars. was immune; 15 of 19 pole vars. were immune or highly resistant and 16 of 18 dry bean vars. were immune. Most previously described races infect chiefly pole and dry beans. The new race is similar to races 10 [**20**, 556] and 28 [**31**, 467].

PAPAVIZAS (G. C.) & DAVEY (C. B.). **Rhizoctonia disease of Bean as affected by decomposing green plant materials and associated microfloras.**—*Phytopathology*, **50**, 7, pp. 516–522, 1 fig., 4 graphs, 1960. [24 ref.]

Some of this information from U.S. Dept Agric., Beltsville, Md. has been noticed [cf. **39**, 66]. In greenhouse studies 5 green organic amendments were added singly at 1% by wt. to unsterilized soil infested with *R.* [*Corticium*] *solani*. After fallow periods of 0–10 weeks Topcrop snap beans [*Phaseolus vulgaris*] were sown. All amendments increased the total of soil and rhizosphere fungi and streptomycetes antagonistic to *C. solani* and suppressed infection, green maize and oats being the most effective, with the best results when the seed was sown 3–7 weeks after incorporation; duration of effectiveness varied with the rate of decomposition of the incorporated material. Bean and buckwheat amendments were intermediate in their effect between the above and Sudan grass or the untreated controls. Disease severity and the rhizosphere/soil ratios of bacteria, streptomycetes, and fungi were not correlated. The degree of colonization by *C. solani* of mature buckwheat stem pieces buried in the soil also indicated reduced prevalence of the pathogen in the amended soil.

DAVEY (C. B.) & PAPAVIZAS (G. C.). **Effect of dry mature plant materials and nitrogen on Rhizoctonia solani in soil.**—*Phytopathology*, **50**, 7, pp. 522–525, 1960.

In further studies [see above; cf. **38**, 466] various plant materials were added at 1% by wt. to soil infested with *R.* [*Corticium*] *solani* and Topcrop snap beans [*Phaseolus vulgaris*] were sown after 4 weeks' fallow. Soybean hay, maize debris, and oat straw reduced infection by *C. solani* and the competitive saprophytic activity of the pathogen on buried pieces of buckwheat; oak sawdust was less effective. Addition of soluble $NH_4NO_3$ or uramite to give 100 p.p.m. N increased the effectiveness of all amendments except soybean and reduced the saprophytic activity of *C. solani*. Both forms reduced the disease when applied alone. The suppression of *C. solani* in the soil is apparently related to general soil microbial activity and in part to the C/N ratio of the amendment, but not to soil reaction.

GEARD (I. D.). **Diseases of Broad Beans and Tick Beans.**—*Tasm. J. Agric.*, **31**, 1, pp. 68–73, 6 fig., 1960.

The occurrence, symptoms, and control of the main diseases of broad beans, including Tick beans, are described. *Ascochyta fabae* [cf. **30**, 502], causing leaf, stem, and pod spot, is severe only in some seasons. Chocolate spot (*Botrytis fabae*) and rust (*Uromyces fabae*) are most severe on autumn and the latter also on spring crops. Broad bean wilt virus [**27**, 5] has recently been found in several localities. A str. of bean yellow mosaic virus [cf. **33**, 7] also occurs but is seldom of economic importance. Mn toxicity is corrected by dressing the soil with lime.

CHANT (S. R.). **The effect of infection with Tobacco-mosaic and Cowpea yellow-mosaic viruses on the growth rate and yield of Cowpea in Nigeria.**—*Emp. J. exp. Agric.*, **28**, 110, pp. 114–120, 2 graphs, 1960.

At the Federal Dept agric. Res., Moor Plantation, Ibadan, Dr. Saunder's Upright cowpea plants were inoculated on the primary leaves with either of these viruses or a mixture of both [cf. **39**, 204] at 2 weeks after sowing. Both viruses significantly reduced leaf area at all samplings, but the effect was considerably less with the tobacco mosaic virus (TMV) str.; the effect of the double infection did not significantly differ from that with cowpea yellow mosaic virus alone. The effect on numbers of leaves produced was similar to that on leaf area, while the mean fresh wt. leaf was significantly greater in the healthy plants. Flower production was adversely affected and the number and total wt. of pods reduced.

Inoculation of New Era and Dr. Saunder's Upright with cowpea yellow mosaic at 2 weeks after sowing caused a marked decrease in both leaf area and yield, while the effect of infections at 4 and 6 weeks was less marked. Infection in a local white var. seemed to have little effect. Results with the cowpea str. of TMV were similar. The local white var. may prove a useful source of resistance to cowpea yellow mosaic.

SAL'NIKOVA (Mme A. F.). О протравливании семян Сои. [On the treatment of Soybean seed.]—Сел. Хоз. Амур. Обл. [*Sel. Khoz. Amur. Obl.*], *1958*, 1, pp. 35–38, 1958. [Received June 1960.]

In experiments at Blagoveshchensk agric. Inst. seed treatment on moist filter paper with granosan, mercuran, and hexachlorbenzole at 3–8 kg./1,000 kg. seed was shown to control bacteriosis [*Pseudomonas glycinea*: cf. **37**, 626] and fusariosis [*Fusarium* sp.] without affecting germination. A 13·5% combined infection of Amurskaya zheltaya 41 was reduced to 2% by granosan and to 1·5% by mercuran. Seed germinating in moist sand at 18–20° [C.] easily tolerated dosages up to 2 kg./1,000 kg.; higher rates inhibited the development of seedlings, particularly of their roots. In the field 3 kg./1,000 kg. was sufficient to lower the diseases considerably, but for growth the most favourable was granosan at 1 kg. (107·1% of the untreated) and mercuran at 2 kg. (102·2%).

SMARTT (J.). **Groundnuts in Northern Rhodesia.**—*Rhod. agric. J.*, **57**, 1, pp. 69–72, 1960.

A section on pests and diseases notes that the most usual form of groundnut rosette virus [**34**, 707; map 49] is yellow rosette, and occurs in patches of varying size throughout infected plantings. Leaf spot, caused by *Cercospora personata* [*Mycosphaerella berkeleyi*] and *C.* [*M.*] *arachidicola* [**39**, 211] can cause losses up to 50% in susceptible vars., but most of the native vars. are resistant. Modern seed dressings contain thiram, which controls *Aspergillus niger* [**34**, 707], the cause of crown rot, in addition to seedling and pre-emergence rots.

*Sclerotium rolfsii* causes a leaf thread blight and a basal stem rot and is implicated in 'blue damage' of the kernels [cf. **34**, 125]. 'Concealed damage', as a result of which the oil in the embryo cotyledons becomes rancid, is controlled by rapid curing. Bacterial wilt (*Pseudomonas solanacearum*) seldom causes serious damage.

SMITH (T. E.). **Occurrence of Verticillium wilt on Peanuts.**—*Plant Dis. Reptr*, **44**, 6, p. 435, 1960.

In 1958 and 1959 groundnuts in Roosevelt County, N. Mex., were infected by *V. alboatrum*, which occurs generally on cotton in this area. In a field area where high soil moisture prevailed 25% of the crop was severely affected.

Newhall (A. G.) & Wilkinson (R. E.). **Liquid nabam and N-dure as substitutes for formaldehyde in the control of Onion smut, Urocystis cepulae.**—*Plant Dis. Reptr*, **44**, 5, p. 332, 1960.

In greenhouse trials at Cornell Univ., Ithaca, N.Y., nabam and N-dure (59% formaldehyde and 26% urea; N Div., Allied chem. and Dye Corp., N.Y.) reduced *U. cepulae* [cf. **39**, 205] from 52 to 2·1 and 1·9%, respectively, compared with 2·9% with formaldehyde, and were also more effective at 1% (125 gal./acre) in the field.

Burić (S.) & Blagojević (M.). **Prilog ispitivanju mogućnosti suzbijanja gari Luka (arpadžika).** [Contribution to the study of the possibility of control of Onion smut.]—*Zasht. Bilja* (*Plant Prot., Beograd*), *1959*, 54, pp. 77–86, 1959. [Engl. summ.]

At the Agric. Sta. and the Tobacco Inst., Mostar, Yugoslavia, the most successful control of *Urocystis cepulae* was obtained by seed treatment with 50% thiram dusts [cf. **33**, 652]. Soil disinfection with solutions of organic fungicides, especially thiram, or of formalin was effective, but inconvenient and expensive, and formalin appeared to be phytotoxic. Seed dips in a variety of compounds or dusting with organo-mercuric products proved unsatisfactory.

Horin (M.) & Palti (J.). **Ha-ḥalfat ba-Betsel.** [*Alternaria* on Onion.]—*Hassadeh*, **40**, 9, p. 1086, 1 fig., 1960.

*A. porri* [map 350] is widespread on onion in all parts of Israel in the spring and summer, especially in seed plots. In recent yr. there has been high infection in the Negev, with extensive withering of leaves. All large onion vars. in Israel seem to be susceptible. From the Agric. res. Sta., Rehovot, zineb at 500 g. 15–80 l. dunam is recommended for control. In highly infected areas initial spraying should be every 10 days for the 1st 2 months, then fortnightly. Seed onions should also be sprayed every fortnight. Spraying should generally be started as soon as symptoms appear on the leaves and stalks. In the Negev preventative sprays should be applied after sand storms [cf. **39**, 341].

Joshi (N. C.) & Agnihotri (J. P.). **Occurrence of a serious disease of Allium cepa Linn. from India.**—*Sci. & Cult.*, **25**, 10, pp. 597–598, 1 fig., 1960.

A report from Government Coll., Ajmer, of *Alternaria allii* at Kekri noted for the 1st time in 1953. Inoculation of leaves with a heavy spore suspension caused in 13–14 days typical purple spots, from which the fungus [cf. **6**, 524] was reisolated.

Kulik (M. M.) & Tims (E. C.). **Screening of fungicides and chemotherapeutants for control of pink root of Onions and Shallots.**—*Plant Dis. Reptr*, **44**, 6, pp. 379–382, 1 fig., 1960.

Similar information from another source has been noticed [**39**, 141].

Hein (Alice). **Über das Vorkommen einer Virose an Spargel.** [On the occurrence of a virosis of Asparagus.] *Z. PflKrankh.*, **67**, 4, pp. 217–219, 2 fig., 1960.

This preliminary note from the Institut für Gemüsekrankheiten und Unkrautforschung, Fischenisch, Kr. Köln, Germany, reports the occurrence in the Lower Rhine and certain other areas of a virus infection of asparagus, not transmitted by seed. In all plantings examined all or most of the sample plants were infected. The symptoms have not yet been fully established, and are not described. The virus was transmitted by abrasion to *Chenopodium quinoa* and *C. album*, producing, in 5–12 days, reddish-brown lesions 1–2 mm. diam., with a small parchment-coloured centre and more or less diffuse yellow halo. On *C. urbicum* the lesions were likewise local, and of the same size, but were parchment-coloured, with or without

a narrow brown perimeter, and there was no halo. On *Gomphrena globosa* they were local, reddish-violet, and of varying size.

Aphids [unspecified] transmitted the virus and are thought to be the principal vectors.

Cox (R. S.). **Etiology and control of Celery diseases in the Everglades.**—*Bull. Fla agric. Exp. Sta.* 598, 14 fig. (2 col.), 1958. [Received Aug. 1960.]

Much of this information from the Everglades Exp. Sta. has already been noticed. The etiology and control of seed-bed diseases are dealt with [**36**, 631]. Post-emergence damping-off (mostly *Rhizoctonia* [*Corticium*] *solani*), early blight (*Cercospora apii*) [**39**, 77], bacterial blight (*Pseudomonas apii*) [**37**, 701], and anthracnose [*Colletotrichum truncatum*: **37**, 387] were all controlled by foliar sprays of chloranil + zineb + streptomycin, neutral Cu + zineb + streptomycin, or thiram + zineb + streptomycin. In the field the best control of *Cercospora apii* was given by dyrene (2 lb. 100 gal.) and of *Corticium solani* by thiram (2 lb./100 gal.).

Yamaguchi (M.), Takatori (F. H.), & Lorenz (O. A.). **Magnesium deficiency of Celery.**—*Proc. Amer. Soc. hort. Sci.*, **75**, pp. 456–462, 1 fig., 1960.

Yellowing of Utah 10-B celery plants in Calif. was controlled by weekly and bi-weekly sprays of 0·1 lb. $MgSO_4$ gal. The increase in Mg absorption only lasted for a subsequent few weeks. The Mg deficiency [**32**, 661] was associated with high Ca content.

In greenhouse experiments at the Univ. Calif., Davis and Riverside, it was confirmed that the chlorosis was intensified by high Ca combined with low Mg. With normal Ca levels chlorosis occurred at a leaflet content of less than 0·1% Mg, but at high Ca chlorosis developed at 0·2% Mg.

Costa (A. S.), Duffus (J. E.), & Bardin (R.). **Malva yellows, an aphid-transmitted virus disease.**—*J. Amer. Soc. Sug. Beet Tech.*, **10**, 5, pp. 371–393, 3 fig., 1959.

The disease herein newly reported from the U.S. agric. Res. Sta., Salinas, Calif., is believed to be 1 of the components of the spinach-yellowing complex in the Salinas Valley and probably also a factor in similar disorders of other plants. Its incidence is high in all seasons on *Malva parviflora*, the lower and middle leaves of which develop marked, though often only temporary chlorosis, sometimes sectorial in the early stages but tending to spread over most of the surface. Other plants from which the virus has been recovered include beet, cabbage, *Hibiscus esculentus*, lettuce, *M. rotundifolia*, *Nicotiana alata*, *N. clevelandii*, *Petunia hybrida*, radish, spinach (sometimes accompanied by beet yellows virus), *Tetragonia expansa*, zinnia, and a number of common weeds [cf. **39**, 753].

*M.* yellows virus (*Corium malvae*) was shown to be transmissible by *Myzus persicae*, *M. ornatus*, and *Aphis gossypii*, of which the 1st-named proved particularly efficient, transmitting infection to upwards of 50% and commonly to all of the plants colonized. It acquired the virus 1½ hr. after feeding on the source plants and was able to infect healthy ones within the same period. The incubation period in the aphid was 12–24 hr. and the virus was retained for 18 days in serial transfers. Single individuals were shown to carry simultaneously both the *M.* and beet yellows viruses. The former was also transmitted by grafting but not by mechanical inoculation.

Rich (S.). **Terraclor controls Olpidium on Lettuce. Infectivity differences between Olpidium from roots of Spinach and Lettuce.**—*Plant Dis. Reptr*, **44**, 5, pp. 352–353; p. 353, 1960.

At Conn. agric. Exp. Sta., New Haven, 75% terraclor + sand (at 50 p.p.m.) totally

protected lettuce seedlings from *O. brassicae* and should thus control big-vein [cf. **37**, 621], whereas Zn did not.

Direct and cross inoculations with a suspension of macerated *O.*-infected roots (25 ml. inoculum/pot) from lettuce var. Great Lake (with big-vein symptoms) and spinach var. Bloomsdale Long Standing resulted within 2 months in *O.* infection + big-vein in 5 of 7 lettuce plants with lettuce inoculum and 1 (no big-vein) of 7 with spinach inoculum. All of 7 spinach plants with spinach inoculum became infected by *O.* (but with no big-vein) and none of the 7 with lettuce inoculum.

SCHNATHORST (W. C.). **Relation of microclimates to the development of powdery mildew of Lettuce.**—*Phytopathology*, **50**, 6, pp. 450–454, 3 graphs, 1960. [22 ref.]

In further studies at Univ. Calif., Davis [**39**, 648], using wet and dry thermocouples it was found that though a dry field of lettuce showed no gradient, R.H. increased 6% in sunlight and 10% in shade between points 1 m. and 5 cm. above the soil surface of a wet field. Even so, R.H. and temp. gradients around lettuce plants appeared too small to account for the gradients of infection by *Erysiphe cichoracearum*. In the lab. R.H. was 66% at the leaf surface when 55% in the room, and the poor germination of conidia on the leaf (not more than 2%) indicated that R.H. was below 79%. It became apparent that at most the microclimate could add 2 hr. to any period favourable for germination (93–98% R.H. at 25° C.), and it seems, therefore, that in the Salinas Valley the disease is mainly influenced by macroclimate.

HOFF (J. K.) & NEWHALL (A. G.). **Corky root rot of Iceberg Lettuce on the mucklands of New York.**—*Plant Dis. Reptr*, **44**, 5, pp. 333–339, 6 fig., 1960.

This disease [cf. **35**, 68; **36**, 228], also referred to as 'stunt', studied at Cornell Univ., Ithaca, was most severe in soil with over 400 lb. N ($NH_4$) acre at pH close to 5 and least with under 50 lb. N and pH above 5·4. If pH was above 5·5 quantities up to 300 lb./acre were tolerated. The var. 456 was very susceptible, whereas Big Boston, Cos, and some others were resistant. The rot developed in sand culture with ammoniated $NH_4NO_3$ at over 100 lb. N/acre and also in steamed muck, poor in $NH_4$, with addition of urea, uramite M, and $NaNO_2$, but not with $NaNO_3$ or $NH_4NO_3$. The injuries caused by nitrites differed slightly from those caused by $NH_4$. Bacteria and spp. of *Pythium*, *Fusarium*, *Cephalosporium*, and *Thielaviopsis* were frequently isolated from the margins of the lesions, but did not produce typical symptoms, their pathogenicity being of secondary importance.

MACLACHLAN (D. S.). **Two virus diseases of Rhubarb in Eastern Ontario.**—*Canad. J. Pl. Sci.*, **40**, 1, pp. 104–109, 2 pl. (7 fig.), 1960. [9 ref.]

Further details are given from Canada Dept Agric., Ottawa, of information already noticed [**38**, 377]. Virus I was inactivated after 10 min. at 65° C. and the dilution end point was 1:2,000, virus II at 75° and 1:8,000. Both were mechanically transmitted with 1:100 crude sap in 0·1 M phosphate buffer (pH 8–9). Isolation of the virus strs. was not possible at all seasons; particles of both were $478 \times 15\,\mu$m. Serological comparison with a similar virus from Germany [**37**, 64] is in progress.

COOK (A. A.). **Genetics of resistance in Capsicum annuum to two virus diseases.**—*Phytopathology*, **50**, 5, pp. 364–367, 1960.

Further studies at Univ. Fla, Gainesville, showed that resistance to tobacco etch virus in the P11 str. of *C. annuum* resulted from a single recessive gene, as did

resistance to potato virus Y, the factors being the same as those in str. S.C. 46252 [**39**, 453]. The apparent association of the genetic factors for resistance to the 2 diseases is presumably due to either close linkage of 2 genes or the pleiotropic effects of 1 recessive gene, and inability to demonstrate recombinant genotypes indicates the latter explanation. It is proposed to designate this gene ey[a].

Simons (J. N.). **Factors affecting field spread of Potato virus Y in South Florida.**—*Phytopathology*, **50**, 6, pp. 424–428, 2 diag., 1960.

Further details from Everglades Exp. Sta. Univ. Fla, Belle Glade [cf. **37**, 701], show that primary spread of pepper veinbanding mosaic virus (= potato virus Y) from infected *Solanum nigrum* to California Wonder pepper (*Capsicum annuum*) was reduced 50% by a 1-row border of sunflower on 3 sides, 70% by a 50 ft. band of beans (*Phaseolus vulgaris*) outside this, and 85% when the beans were sprayed weekly with parathion (2 lb. 100 gal.). After 6 weeks sunflower alone gave little or no protection: unsprayed beans reduced the disease by $\frac{1}{3}$ and sprayed beans by $\frac{1}{2}$.

In another experiment 6–8 leaf, potted pepper plants were arranged concentrically (3 circles) and left for 5 days within circles (diam. 35 225 ft.) of *S. nigrum* plants, 6 weeks old, which had been inoculated and were either sprayed or left untreated. Twice-weekly sprays with parathion reduced primary spread to pepper markedly; demeton appeared less effective.

In the greenhouse Italian El pepper proved highly resistant to PVY when inoculated either mechanically or by *Myzus persicae*, though when infection did take place, the virus titre was as high as that in the susceptible California Wonder. In field plots PVY spread more slowly in Italian El than in California Wonder; when the 2 vars. were interplanted rate of spread in the latter was reduced, but the increased inoculum on this var. caused more rapid spread in Italian El.

Murakishi (H. H.). **A necrotic pod streak of Pepper caused by Tobacco mosaic virus.**—*Phytopathology*, **50**, 6, pp. 464–466, 3 fig., 1960.

At Mich. State Univ., E. Lansing, a virus causing slightly raised, reddish-brown streaks on the fruit of Hungarian Sweet pepper (*Capsicum annuum*) plants, which were partially defoliated, with some pith necrosis, was shown to be a str. of tobacco mosaic (TMV). It differed from Miller and Thornberry's virus [**38**, 338] in thermal inactivation, 93° C. for 10 min., and from Holmes' distorting str. of TMV [**16**, 711] by failure to react with Pinto and Scotia bean (*Phaseolus vulgaris*). Plants inoculated at 1st flowering developed pod streak and stem necrosis in 4–6 weeks; those with immature pods, internal pod necrosis. On the small fruited Hungarian Sweet and 2 related vars. pod streaks appeared at 17 28° C., but not on larger fruited types.

Dempsey (A. H.). **Inheritance studies of certain fruit and plant characters in Capsicum frutescens.**—*Diss. Abstr.*, **20**, 7, pp. 2506–2507, 1960.

At Ohio State Univ., Santanka, an introduction from Japan with small, erect, elongated, pungent fruits, and resistant to *Xanthomonas vesicatoria* [cf. **28**, 436; **39**, 270], was used as female parent and crossed with the susceptible Truhart Perfection, which has conical, pendent, non-pungent fruits. Susceptibility to *X. vesicatoria* was inherited as a monogenic, dominant character. In greenhouse inoculations homozygous resistant lines were recovered in the $F_3$ from plants phenotypically resistant in $F_2$.

Winstead (N. N.) & Kelman (A.). **Resistance to bacterial wilt in Eggplant in North Carolina.**—*Plant Dis. Reptr*, **44**, 6, pp. 432–434, 1960. [19 ref.]

In field and greenhouse tests at N. Carol. State Coll., Raleigh, the best resistance to *Pseudomonas solanacearum* [cf. **32**, 547, 671] was displayed by the vars. Matale and Kopek (neither of which became diseased in the field), while Florida Market, Florida

High Bush, and Fort Myers Market were intermediate in reaction, and Black Beauty and New York Spineless were killed. The resistant vars. are not ideal commercially, but should be of value in breeding.

Israfilbekov (L. E.). Хиjарын фузариоз хәстәлиjиһаггында. [On fusariosis disease of Cucumbers.]—Елми Әсәрләр Азәрб. Унив. [*Elmi Eserler Azerb. Univ.*], biol. Ser., *1959*, 2, pp. 29–35, 1959. [Russ. summ. Abs. in *Referat. Zh. Biol., 1960*, 6, p. 203, 1960.]

An expedition to Azerbaijan in 1957 to study the cucurbits of the Kuba-Khachmas massif found that the most serious and widespread disease was cucumber wilt (*Fusarium solani* var. *argillaceum*). The biological characters were studied.

Strider (D. L.). **Studies on the physiology of parasitism as related to scab of Cucumber incited by Cladosporium cucumerinum.**—*Diss. Abstr.*, **20**, 7, pp. 2484–2485, 1960.

At N. Carol. State Coll. highly resistant cucumber tissue became susceptible to *C. cucumerinum* [cf. **35**, 576] after prolonged incubation at high humidity. Temps. of 30° C. and over were lethal to the fungus *in vitro*. The opt. pH for growth on a citric acid-buffered medium was between 3·5 and 4; when citric acid was replaced by $10^{-2}$ M acetic, propionic, or butyric acid, the fungus was killed at or below this opt. That this toxic effect depended on the pH of the medium was demonstrated when one containing 1·5% acetic acid rendered the fungus no longer viable at pH 6·1 but not at 6·2. Acetic acid inhibited the growth of several other fungi also. Cysteine was toxic between $10^{-3}$ and $10^{-4}$ M in the presence of $KNO_3$.

Analysis of extracts of cucumber fruits harvested in autumn showed marked differences in aspartic acid conc. of the resistant Fletcher var. and the susceptible Stono. Long dark periods before inoculation increased the susceptibility of the resistant var. Large necrotic areas appeared on aspartic acid-treated leaves of Fletcher seedlings after inoculation. The fungus produced cellulase, PG [polygalacturonase], and PME [polymethylesterase] *in vitro*. The cellulase was heat-labile. Large quantities of cellulase were present in diseased seedlings. Certain filtrates of the fungus disintegrated cucumber tissue. It is possible that cellulosic material may continue to be disintegrated by cellulase after the cellulase-producing fungus has been destroyed.

Williams (L. E.). **Factors affecting the pathogenicity of Colletotrichum lagenarium (Pass.) Ell. & Halst.**—*Diss. Abstr.*, **20**, 7, pp. 2516–2518, 1960.

Studies at Ohio State Univ. suggested that the gelatinous matrix in which the conidia are borne may inhibit their germination according to its conc. Distilled water washings of cucumber leaves promoted conidial germination and guttation fluid inhibited or promoted it according to its conc. and the germinability of the conidia.

The initial pH for conidial germination in unbuffered glucose solutions was 3·5, with a 2nd peak at 11·5; this initial value had little effect on appressorium formation [**37**, 751] in contact with thin, hard substrates. The opt. pH values for lesion development on cucumber leaves were 6 and 7·5 with both buffered and unbuffered conidial suspensions. Leaf lesion development was not correlated with conidial germination on glass slides.

In addition to evidence that the matrix accompanying 60,000 conidia/ml. would promote conidial germination, other evidence was obtained indicating that this amount of matrix also promoted lesion development. Dipping cucumber plants in water before inoculation did not affect the no. of leaf lesions that developed. Guttation water had no effect upon the severity of the disease. No toxin synthesis was detected in cultures on a basal dextrose-nitrate medium.

KLEMENT (Z.) & HEVESI (MARY). **Occurrence of Pseudomonas lachrymans in Hungary and Rumania and its bacteriophage.**—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 347–353, 2 fig., 1959. [Roman. summ. 13 ref.]

From the Res. Inst. Plant Prot., Budapest, is reported the isolation of *P. lachrymans* from cucumber [map 355; cf. **39**, 146] and its polyvirulent phage (La $P_1$), which lysed also all the strs. of *P. phaseolicola*, *P. syringae*, and *P. mors-prunorum* tested, but none of other *P.* spp.

HARVEY (H. L.). **Mosaic disease of Cucumbers. A new resistant variety.**—*J. Agric. W. Austr.*, Ser. 4, **1**, 4, pp. 337–340, 4 fig., 1960.

Following successful trials, the cucumber var. Ohio MR 200 (*Res. Circ. Ohio agric. Exp. Sta.* 41, 1957) is recommended for planting in areas where cucumber mosaic virus occurs.

MARTIN (M. W.). **Inheritance and nature of Cucumber mosaic virus resistance in Squash.**—*Diss. Abstr.*, **20**, 9, p. 3462, 1960.

In studies at Cornell Univ. the susceptibility of squash (*Cucurbita pepo*) vars. to cucumber mosaic virus (CMV) was increased by the addition of N or by lowering the light intensity. A positive connexion between susceptibility and low nitrate content of the plant was established, the effect of low light intensity being an indirect one by acting on the N content.

The efficacy of test inoculations was increased by the use of phosphate buffer (pH 7·2) as a virus diluent. The infectivity of various parts of a block of frozen infective juice varied, the darkest green regions being the most infective.

Resistant vars. possessed very little resistance at the cotyledon stage. In older plants the mechanism of resistance appeared to act by hindering virus translocation, and was not due to a lack of precursors or substrates or to hypersensitivity.

Resistance in lines 176959 and 174192 was found to be controlled by two recessive genes in each parent. The parents share a recessive gene conferring field resistance to moderate infection, but this gene must be accompanied by a complementary one to produce resistance under more severe conditions. In conditions of very severe infection resistance broke down.

In *C. maxima* and *C. moschata* var. Butternut resistance to CMV appeared to be due to one or more recessive genes, and in the highly resistant *C. moschata* var. Batangas Native to one or more dominant genes.

LEATHERS (C. R.). **Downy mildew on Watermelon in Arizona, a first report.**—*Plant Dis. Reptr*, **44**, 5, p. 372, 1960.

A note from Ariz. State Univ., Tempe, of *Pseudoperonospora cubensis* [cf. **38**, 659; map 285] on watermelon leaves.

GOODE (M. J.) & READING (G. D.). **Controlling Watermelon leaf diseases with fungicide sprays.**—*Arkans. Fm Res.*, **9**, 2, p. 4, 3 fig., 1960.

The now wide-spread var. Charleston Gray (anthracnose-resistant) severely infected by *Cercospora* leaf spot (*C. citrullina* [cf. **39**, 80]) was effectively treated with 70% maneb at min. 1½ lb./100 gal. or 65% zineb at min. 2 lb./100 gal., the yield increasing by 71 and 65%, respectively. Combined incidence of *C.* leaf spot and anthracnose (*Colletotrichum lagenarium* [cf. **38**, 647]) in Black Diamond and other vars. necessitated the use of maneb or zineb at min. 2 lb./100 gal. for the respective yield increases of 149 and 106%. Applications extending from the first symptoms to 2 weeks before harvest gave excellent control when made after rains, or every 7 days in the absence of rain, but were considerably inferior when made at 10-day intervals regardless of rain.

Bălan (N.), Luburici (C.), & Savinova (Mme N.). **Cercetări asupra producerii miceliului de ciuperci Psalliota campestris.** [Research on production of the mycelium of the mushroom *P. campestris.*]—*Lucr. ştiinţ., Bucureşti, 1957–8*, pp. 277–286, 5 graphs, 1960. [Russ., Engl., Fr. summ. 22 ref.]

At the Centrul Experimental de Îngrăşăminte Bacteriene, Bucharest, studies on culture techniques, with a view to organizing large-scale production of mycelium in mushroom farms, revealed that the opt. temp. for collecting spores from the fruit bodies is 4° C.; that the surest disinfection of spores is obtained from 4–5 hr. immersion in chloroform (density 1·473–1·478), which also stimulates their germination; that pantothenic acid at 1 mg. % shortens the germination period by 2 days; that the mycelium grows best on malt agar; that animal hormones and endocrine gland extracts (folliculin, thyroxin, cortilysate, testolysate) add 0·2–0·7 mm./day to mycelial growth; and that the use of the Centre's product containing mushroom mycelium (grown on barley corn), as compared with an analogous product from Hungary, resulted in 12 days' earlier emergence of fruit bodies, but gave approx. the same yield.

Wood (F. C.). **Mycogone perniciosa (bubble disease).**—*Mushroom News* (W. Darlington & Sons Ltd., Worthing, Sussex), 7, 8, pp. 154–159, 4 fig., 1 graph, 1960.

Following a popular description of *M. perniciosa* [cf. **36**, 511], its life history and methods of spread, control measures are discussed, including dusting beds with 75% zibimate, cropping at 58° F. and no higher, and washing and disinfection of implements and casing with 2% formaldehyde.

Go (L. K.). **Experimental cultivation of Volvaria volvacea (Bulliard) Quélet.**—*Philipp. Agric.*, **43**, 7, pp. 446–467, 7 fig., 1960.

An account of physiological studies at Coll. Agric., Univ. Philippines, on the edible fungus *V. volvacea* and its cultivation on rice straw beds under shade in the open air [cf. **39**, 74]. Fresh coffee pulp spawn was the best of several types tested.

Ochs (Gertrud). **Papierchromatographische Untersuchungen an reisigkranken Reben.** [Investigations of court-noué-diseased Vines by paper chromatography.]—*Wein-Wiss.* (*Beil. Dtsch. Weinb.*), **12**, 8, pp. 88–89, 1958.

Experiments [on vine infectious degeneration virus] already noticed [**37**, 388].

Lelakis (P.). **Au sujet de l'utilisation de la méthode chromatométrique de Lindner dans le diagnostic de la virose de la Vigne. (Dégénérescense infectieuse.)** [Concerning the use of Lindner's chromatometrical method in the diagnostics of Vine virosis. (Infectious degeneration.)]—*Geoponika*, **5**, 65, pp. 1–7, 1959. [Greek. From Fr. summ.]

This method [cf. **29**, 312] used at the Éc. hautes Études agron., Athens, is considered inapplicable as the chromatometrical reaction is unstable with both healthy and infected plants.

Baldacci (E.). **Contributo allo studio delle virosi della Vite in Italia.** [Contribution to the study of the viroses of Vine in Italy.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 31–36, 1959. [Roman. summ. 10 ref.]

An outline from the Univ. Milan of studies on infectious degeneration of vine [**38**, 356 *et passim*], emphasizing the importance of an experimental vineyard containing diseased plants, the history of infection of which is known, and of a clonal selection of healthy European and American vines to enable observation of the modes of virus transmission and of varietal reactions to be made.

ŠARIĆ SABADOŠ [SABADOŠ-ŠARIĆ] (ANA) & CORTE (A.). **Dati preliminari su una forma di 'degenerazione infettiva' della Vite in Istria a complesso sintomologico insolito.** [Preliminary data on a form of infectious degeneration of the Vine in Istria with unusual symptoms.]—*Atti Ist. bot. Univ. Pavia*, Ser. 5, **17**, pp. 268–273, 2 pl., 1960. [Engl. summ.]

A study of what appears to be a form of infectious degeneration of the vine [cf. **39**, 259] in Istria showed that in addition to the usual symptoms present in Italy, the upper surfaces of the leaves bear round, shining spots, 2–6 mm. diam. and isolated or partly confluent, which appear from the end of June onwards. As the season progresses the spots darken, but retain some of their original brilliance and become raised above the leaf surface. Cauliflory also occurs, small clusters of a few undersized fruits arising directly from the trunk and old branches. This symptom was noted only on vines affected by infectious degeneration but it is not known with certainty whether it is caused by the same virus.

OCHS (GERTRUD). **Wie verhalten sich Unkräuter und Nutzpflanzen im Weinberg zum Panaschürevirus der Rebe?** [How do weeds and fodder plants in the vineyard respond to Vine 'panachure' virus?]—*Rebe u. Wein*, **11**, 11, pp. 183–184, 2 fig., 1958.

This note, from the Botanisches Institut, Univ. Freiburg, lists the herbaceous plants collected from vineyards which were found to be carriers of vine 'panachure' virus, indicating symptoms where present [cf. **37**, 754, 755; **38**, 442].

OCHS (G[ERTRUD]). **Paper-chromatographic colorimetric method for expeditious diagnosis of leaf roll virus of Grapevines.**—*Bot. Gaz.*, **121**, 3, pp. 198–200, 1 fig., 1960.

An account of further work on this disease [cf. **39**, 70]. The leaves and shoots of the diseased vines curl characteristically downwards and inwards because of the decomposition of lignin and cellulose to form gummose, with the formation of a specific intermediate product, 4-methyl-D-glucaronic acid, which is readily identified by paper chromatography. A positive reaction was obtained in every test on 625 leaf roll-infected plants, but never with 700 healthy vines or ones infected by other viruses. In healthy scions grafted on leaf roll-diseased stocks the 1st positive reaction to the test occurred 15–41 days after the earliest detection of the virus by electron microscopy.

LAFON (J.), COUILLAUD (P.), & HUDE (R.). **Maladies et parasites de la Vigne. Tome I. Maladies cryptogamiques.** [Diseases and parasites of the Vine. Volume I. Cryptogamic diseases.]—208 pp., 95 fig., 1 diag., 12 graphs, Paris, J. B. Baillière et Fils, 1959. Fr. 1,200.

This book, written especially for vine-growers in the region of Cognac, contains few scientific terms and makes the greatest possible use of illustrations. It gives a detailed account of the symptoms, development, and control of downy mildew (*Plasmopara viticola*) (pp. 11–76); *Oidium* (*Uncinula necator*) (pp. 77–97); black rot (*Guignardia bidwellii*) (pp. 98–107); spotted anthracnose (*Gloeosporium ampelophagum* [*Elsinoe ampelina*]) (pp. 108–111); white rot (*Coniothyrium* [*Coniella*] *diplodiella*) (pp. 112–116); 'roterbrenner' (*Pseudopeziza tracheiphila*) (pp. 117–120); excoriosis (*Phoma reniformis*) [*P.* ? *flaccida*: **36**, 635 *et passim*] (pp. 121–129); esca disease (*Stereum hirsutum* and *Polyporus* [*Fomes*] *igniarius*) [cf. **3**, 314 *et passim*] (pp. 130–136); root rot (*Armillariella* [*Armillaria*] *mellea*, *Dermatophora* [*Rosellinia*] *necatrix*, and other fungi) (pp. 137–139); and grey rot (*Botrytis cinerea*) (pp. 140–150).

A separate chapter is devoted to Cu and organic fungicides and there are a number of appendixes, including tabulated symptoms of the different diseases on each

part of the vine, a compatibility table of different chemicals, and the addresses of various agricultural institutions of interest to vine growers. In the bibliography (pp. 187–205) a list of general works is followed by appropriate references set out under each disease, and it concludes with an extensive list of titles concerning organic fungicides.

KUNDERT (J.). **Auftreten und Bekämpfung der Rebenperonospora im Jahre 1959.** [Incidence and control of Vine *Peronospora* in 1959.]—*Schweiz. Z. Obst- u. Weinb.*, **69**, 3, pp. 61–66, 3 graphs, 1960.

It is reported from the Eidg. Versuchsanstalt, Wädenswil, Switzerland, that the incidence of vine *P.* [*Plasmopara viticola*: **38**, 654] was low for the 4th successive year. Subject to the weather and the development of the vines it has been found best to delay the 1st spraying until the 1st week of June and to carry out a late treatment in the 1st 10 days of Aug. With slight rainfall, as in 1959, 5 sprays should be sufficient.

BARRA (I.). **A Szőlőperonoszpóra fertőzés mérvét és az ellene való védekezés idejét befolyásoló tényezők.** [Factors affecting the degree of infection of Vine with mildew and the periods of its control.]—*Szőlősz. kut.*, **11**, 1, pp. 103–118, 1958. [Russ., Germ., Fr. summ. Abs. in *Referat. Zh. Biol.*, *1960*, 12, p. 208, 1960.]

To elucidate the connexion between weather conditions and the development of mildew [*Plasmopara viticola*: cf. **38**, 378] experimental data obtained at Kecskemét, Hungary, in 1955–6 are analysed. The computation of incubation periods according to the Ishtvanfi-Palinkash calendar seems to afford a more satisfactory forecast than the method of the effective sum of temps. Advice is given on control.

BONTEA (VERA) & GALUȘINSCHI (ALEXANDRA). **Eficacitatea produsului indigen pe bază de etilenbisditiocarbamat de zinc în combaterea manei (Plasmopara viticola (Berk. et Curt.) Berl. et de Toni) în pepinierele Viticole.** [An effective local product based on zinc ethylenebisdithiocarbamate in control of mildew (*P. viticola*) in Vine nurseries.]—In *Omagiu lui T. Săvulescu* [see **39**, 667], pp. 83–90, 1 fig., 2 graphs, 1959. [Russ., Fr. summ. 18 ref.]

A further note on carbadin (65% zineb), manufactured by the Inst. chem. Res. [**38**, 349].

GALZY (Mme R.). **Observations sur un champignon maculicole des feuilles de Vigne.** [Observations on a leafspot fungus on Vine.]—*Ann. Épiphyt.*, **10** (*1959*), 4, pp. 423–440, 11 fig., 1 graph, 1960. [14 ref.]

Leaf spots, which are described, on vine leaves received from Afghanistan in 1956 at the Station de Recherches viticoles de Montpellier were found to be caused by *Exosporium sultanae* [**27**, 216], the behaviour of which in culture is described. The taxonomy of the organism is discussed.

**Herb. I.M.I. Handbook. Methods in use at the Commonwealth Mycological Institute.** —[viii]+103 pp., 6 pl., 8 fig., Kew, C.M.I., 1960. 12*s.* 6*d.*

This booklet, dedicated to E. W. Mason on his retirement and published to coincide with the 6th Commonwealth Mycological Conference in July 1960, opens with an interesting account by Dr. S. P. Wiltshire of the history and running of the Institute to date. A series of articles by members of the staff includes advice on different forms of collecting, notes on some of the major publications, and a detailed account of methods and techniques used in the Herbarium and the Culture Collection.

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